

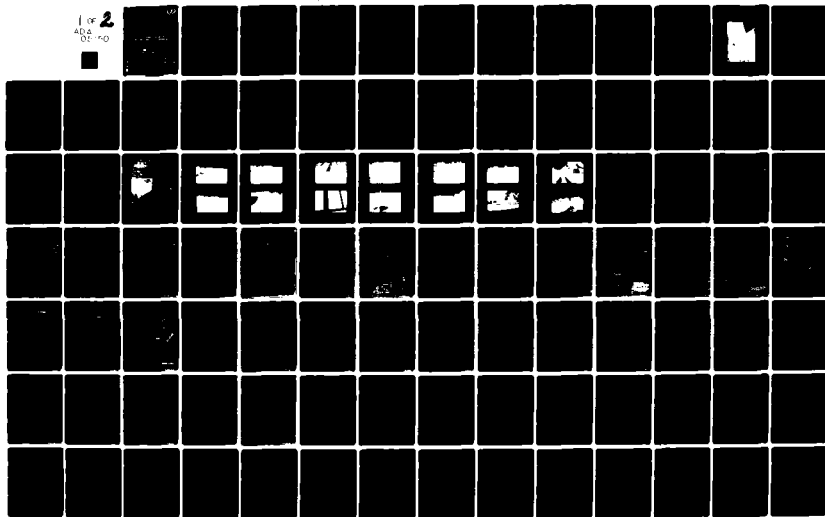
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NATIONAL DAM SAFETY PROGRAM. PLATTE RIVER TRIBUTARIES DAM 3-B (---ETC(U)
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MISSOURI-NEMAHA-NODAWAY BASIN

PLATTE RIVER TRIBUTARIES DAM 3-B

WORTH COUNTY, MISSOURI

MO. 11054

PHASE 1 INSPECTION REPORT NATIONAL DAM SAFETY PROGRAM



United States Army
Corps of Engineers

...Serving the Army
...Serving the Nation

St. Louis District

PREPARED BY: U.S. ARMY ENGINEER DISTRICT, ST. LOUIS

FOR: STATE OF MISSOURI

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1. REPORT NUMBER	2. GOVT ACCESSION NO. <u>AD-A105150</u>	3. RECIPIENT'S CATALOG NUMBER
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7. AUTHOR(s) Hoskins-Western-Sonderegger, Inc. <u>Rey S. /Decker Gordon /Jamison</u> <u>Garold /Ulmer Harold P. /Hoskins</u>		6. PERFORMING ORG. REPORT NUMBER
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Dam Safety, Lake, Dam Inspection, Private Dams		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report was prepared under the National Program of Inspection of Non-Federal Dams. This report assesses the general condition of the dam with respect to safety, based on available data and on visual inspection, to determine if the dam poses hazards to human life or property.		

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PLATTE RIVER TRIBUTARIES DAM 3-B
WORTH COUNTY, MISSOURI
MISSOURI INVENTORY NO. MO 11054

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

PREPARED BY
HOSKINS-WESTERN-SONDEREGGER, INC.
CONSULTING ENGINEERS
LINCOLN, NEBRASKA

UNDER DIRECTION OF
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
FOR
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REPLY TO
ATTENTION OF

SUBJECT: Platte River Tributaries Dam 3-B - MO 11054

This report presents the results of field inspection and evaluation of the Platte River Tributaries Dam 3-B. It was prepared under the National Program of Inspection of Non-Federal Dams.

SIGNED

SUBMITTED BY:

Chief, Engineering Division

25 SEP 1980
24 SEP 1980

Date

APPROVED BY:

SIGNED

Colonel, CE, District Engineer

25 SEP 1980

Date

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM
ASSESSMENT SUMMARY

Name of Dam	Platte River Tributaries Dam 3-B
State Located	Missouri
County Located	Worth County
Stream	Tributary to Platte River
Date of Inspection	June 4, 1980

Platte River Tributaries Dam 3-B was inspected by an interdisciplinary team of engineers from Hoskins-Western-Sonderregger, Inc. The purpose of the inspection was to make an assessment of the general conditions of the dam with respect to safety, based upon available data and visual inspection, in order to determine if the dam poses hazards to human life or property.

The guidelines used in the assessment were furnished by the Department of the Army, Office of the Chief of Engineers and developed with the help of several Federal and State agencies, professional engineering organizations, and private engineers.

Platte River Tributaries Dam 3-B has a height of thirty-two (32) feet and a storage capacity at the minimum top elevation of the dam of forty-six (46) acre-feet. In accordance with the guidelines, a small size dam has a height greater than or equal to twenty-five (25) feet but less than forty (40) feet and a storage capacity greater than or equal to fifty (50) acre-feet but less than one thousand (1,000) acre-feet. The size classification is determined by either the storage capacity or height, whichever gives the larger size category. Platte River Tributaries Dam 3-B is classified as a small size dam.

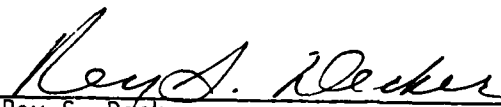
In accordance with the guidelines and based on visual observation, the dam is classified as having a high potential for damage and loss of life. Failure would threaten life and property. The estimated damage zone extends approximately one (1) mile downstream of the dam. Within the damage zone are 24 dwellings located in the town of Sheridan which is located between three-tenths and six-tenths of a mile downstream from the dam.

Our inspection and evaluation indicates that the spillways meet the criteria set forth in the recommended guidelines for a small dam having a high hazard potential. Considering the small volume of water impounded, one-half of the Probable Maximum Flood is the appropriate spillway design flood. The spillways will pass the 100-year flood (1% probability flood - a flood having a one percent chance of being exceeded in any year) without overtopping the dam. The spillways will pass 65% of the Probable Maximum Flood without overtopping the dam. The Probable Maximum Flood (PMF) is defined as the flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region.

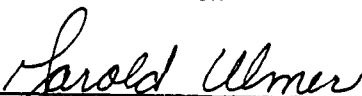
Based on available design data and on the observations made during the field inspection, no recommendation is made to modify the spillways or to increase the height of the dam.

The following recommendations are made in regard to maintenance of the dam:

- a. Trees and brush should be removed from the upstream slope and measures taken to prevent their recurrence. Removal of large trees should be done under the guidance of a professional engineer experienced in the design and construction of dams.
- b. The activity and extent of the slides in the right bank of the scour hole should be monitored. Measures to eliminate the ponding of surface runoff in the area above the slide should facilitate stabilization of the slide area.
- c. Regular inspections of the structure should be continued with the reports made a part of this project file.


Rey S. Decker
E-3703


Gordon Jamison


Garold Ulmer
E-19246

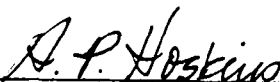

Harold P. Hoskins, Chairman of the Board
Hoskins-Western-Sonderegger, Inc.
E-8696



PHOTO NO. 1 - OVERVIEW

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
PLATTE RIVER TRIBUTARIES DAM 3-B MO 11054
WORTH COUNTY, MISSOURI

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

- a. Authority. The National Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army through the Corps of Engineers, to initiate a program of safety inspection of dams throughout the United States. Pursuant to the above, the St. Louis District, Corps of Engineers, District Engineer directed that a safety inspection of Platte River Tributaries Dam 3-B be made.
- b. Purpose of Inspection. The purpose of the inspection was to make an assessment of the general condition of the dam with respect to safety, based upon available data and visual inspection, in order to determine if the dam poses hazards to human life or property.
- c. Evaluation Criteria. Criteria used to evaluate the dam were furnished by the Department of the Army, Office of the Chief of Engineers, in "Recommended Guidelines for Safety Inspection of Dams", Appendix D to "Report of the Chief of Engineers on the National Program of Inspection of Dams," dated May, 1975, and published by the Department of the Army, Office of the Chief of Engineers.

1.2 DESCRIPTION OF PROJECT

- a. Description of Dam and Appurtenances.
 - (1) The dam is an earth fill designed by the Soil Conservation Service and constructed for flood control. It is about 32 feet in height and 350 feet in length. It has a storage capacity at the minimum top elevation of the dam of 46 acre-feet. It is located in the loess-till area of the north western section of Missouri.
 - (2) The principal spillway is uncontrolled and consists of a 6' x 2' reinforced concrete drop inlet (riser) connected to a 24-inch diameter reinforced concrete pipe which passes through the embankment.
 - (3) An uncontrolled, vegetated earth spillway is cut through the left abutment. It has a bottom width of 50 feet and side slopes of 1V on 3H.

- b. Location. The dam is located in the extreme northwest section of Worth County about 0.3 mile northwest of the town of Sheridan, Missouri in the SE 1/4 Sec. 15, T66N, R33W.
- c. Size Classification. Criteria for determining the size classification of dams and impoundments are presented in the guidelines referenced in paragraph 1.1c above. This dam has a height of 32 feet and a storage capacity at the minimum top elevation of the dam of 46 acre-feet. This dam is classified as a small dam. A small dam has a height greater than or equal to 25 feet but less than 40 feet and a storage capacity greater than or equal to fifty acre-feet but less than 1,000 acre-feet. The size classification is determined by either the storage capacity or height, whichever gives the larger size category.
- d. Hazard Classification. Guidelines for determining hazard classification are presented in the same guidelines as referenced in paragraph 1.1c above. Based on referenced guidelines and visual observation, this dam is in the High Hazard Classification. The estimated damage zone extends about one mile downstream of the dam. Within the damage zone are 24 dwellings located in the town of Sheridan which is located between three-tenths and six-tenths of a mile downstream from the dam.
- e. Ownership. The dam is located on property owned by Lucile Aldrich, Sheridan, Missouri 64486. Inspection and maintenance is done by the Worth County Soil Conservation District, Grant City, Missouri 64456.
- f. Purpose of Dam. The dam was constructed for flood control.
- g. Design and Construction History. The dam was investigated and designed by the Soil Conservation Service, Columbia, Missouri. The dam was constructed in 1961 with SCS personnel providing construction control and inspection.
- h. Normal Operating Procedure. There are no operating procedures for this structure. The level of the lake is dependent upon precipitation, infiltration, evaporation and the capacity of the uncontrolled spillways.

1.3 PERTINENT DATA (SCS PLANS)

- a. Drainage Area. 112 acres (0.175 square miles).
- b. Discharge at Damsite.
 - (1) All discharges at the damsite are through an uncontrolled 6' x 2' reinforced concrete drop inlet which is connected to a 24-inch reinforced concrete pipe conduit and through an uncontrolled, vegetated earth emergency spillway.

- (2) Estimated maximum flood at damsite -- unknown.
- (3) The principal spillway capacity varies from 0 c.f.s. at elevation 120.0 feet to 68 c.f.s. at the crest of the emergency spillway (elevation 123.6 feet) to 73 c.f.s. at the minimum top of dam (elevation 127.1 feet, field measurement).
- (4) The emergency spillway capacity varies from 0 c.f.s. at its crest (elevation 123.6 feet) to 970 c.f.s. at the minimum top of dam (elevation 127.1 feet).
- (5) Total spillway capacity at the minimum top of dam is 1,043 c.f.s. ±.

c. Elevations (feet - assumed).

- (1) Observed pool - 120
- (2) Normal pool - 120
- (3) Spillway crest (s)
Principal - 120
Emergency - 123.6
- (4) Maximum experienced pool - Unknown
- (5) Top of dam (minimum) - 127.1

d. Reservoir. Length (feet) of pool -

- (1) At principal spillway crest - 500 ±
- (2) At emergency spillway crest - 650 ±
- (3) At top of dam (minimum) - 850 ±

e. Storage (Acre-feet).

- (1) Observed pool - 20.6
- (2) Normal pool - 20.6
- (3) Spillway crest (s)
Principal - 20.6
Emergency - 31.4

(4) Maximum experienced pool - Unknown

(5) Top of dam (minimum) - 46.0

f. Reservoir Surface (Acres).

(1) Observed pool - 2.7

(2) Normal pool - 2.7

(3) Spillway crest (s).

Principal - 2.7

Emergency - 3.6

(4) Maximum experienced pool - Unknown

(5) Top of dam (minimum) - 4.8

g. Dam.

(1) Type - Homogeneous rolled earth fill

(2) Length - 350 feet \pm

(3) Height - 32 ft. \pm - measured

(4) Top width - 15 ft.

(5) Side slopes.

(a) Downstream - 1V on 2.5H (Plans) 1V on 3+H (measured)
with 10 ft. berm at elevation 108.0

(b) Upstream - 1V on 2.5H (Plans) 1V on 4.4H (measured
on exposed face) with 10 ft. berm at elevation 120.0.

(6) Zoning - None

(7) Impervious core - homogeneous section

(8) Cutoff - 8 ft. bottom width with 1V on 1H side slopes and
varying in depth from 3 to 10 ft.

(9) Grout curtain - None

(10) Wave protection - vegetated earth berm 10 ft. in width.

(11) Drains - None

h. Diversion Channel and Regulating Tunnel. None

i. Spillway.

(1) Principal

(a) Type - a 6' x 2' uncontrolled, reinforced concrete drop inlet (riser) equipped with an anti-vortex device and a trash rack and connected to a 24-inch diameter reinforced concrete conduit with 3 anti-seep collars.

(b) Crest (invert) elevation - 120.0

Outlet - 99.0 (99.7 measured)

(c) Length - 130 ft.

(2) Emergency

(a) Type - Uncontrolled, vegetated earth spillway having a bottom width of 50 feet and side slopes of 1V on 3H.

(b) Control section - Level section, 20 feet in length located downstream from the centerline of the dam.

(c) Crest elevation - 123.6

(d) Upstream Channel - Upstream channel is excavated 3 ft. lower than the control section and has an inverse grade into the reservoir. The channel is vegetated.

(e) Downstream Channel - Downstream channel is excavated and/or diked on slope of 8%. The channel is vegetated.

j. Regulating Outlets. None

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

Design data were available for this dam from the SCS office in Grant City, Missouri. Copies of the plans are included in Appendix C. The geologic and soil mechanics reports were not available. However, the geologic profiles are included in the plans, and basic soil mechanics data with slope stability analyses were secured from the SCS Soil Mechanics laboratory records in Lincoln, Nebraska. The Soil Mechanics data are included as part of Appendix C.

2.2 CONSTRUCTION

No construction data were readily available. It was reported by SCS personnel that the dam was constructed in 1961, that there were no unusual problems, and that the dam was constructed according to the construction specifications.

2.3 OPERATION

No data were available on spillway operation.

2.4 EVALUATION

- a. Availability. All data in the Grant City SCS office and the Lincoln Soil Mechanics Lab were readily available.
- b. Adequacy. The plans and data supplied by SCS, and the field surveys and visual observations presented herein are considered adequate to support the conclusions of this report. Results of stability analyses (with full phreatic line) are shown on Plates C-19 and C-20. Although the safety factors reported for the downstream slope are somewhat lower than generally accepted, the analyses are considered adequate since the dam has been in place for almost 20 years without any shear failures.
- c. Validity. All available information and reports on construction control are considered to be valid.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

- a. General. A visual inspection of the Platte River Tributaries Dam 3-B was made on June 4, 1980. Engineers from Hoskins-Western-Sonderegger, Inc., Lincoln, Nebraska making the inspection were: R. S. Decker, Geotechnical, Garold Ulmer and Gordon Jamison, Hydrology and Hydraulics.
- b. Dam.
 - (1) Geology and Soils (abutment and embankment). This dam is located in the dissected till plains area of the Central Lowlands Physiographic Region. Upland soils consist of moderately thick deposits of CL loess (Grundy and Lagonda Series). Abutment materials consist of loess overlying Kansan age glacial till. Bedrock of the Shawnee Group, Virgilian Series, Pennsylvanian System underlies the glacial till at undetermined depths. Neither glacial till nor bedrock were exposed on the site or in the area. Materials in the embankment consist of CL-CH soils borrowed from the reservoir area and the abutments.
 - (2) Upstream Slope. The upstream slope is very well vegetated with adapted grasses. A few small shrubs are growing near the downstream edge of the berm. Measurements on the exposed slope indicate that the slope is flatter than shown on the plans in Appendix C. No deformations, rodent holes, slumps or significant erosion were observed on the slope. Photo No. 2 shows the upstream slope.
 - (3) Crest. The crest is well vegetated except for a few sparse spots in the slightly used vehicular tracks. No cracks or slumps were observed on the crest. The constructed crest elevation was planned at 127.4 ft. Measurements indicate that the crest elevation equals or exceeds this elevation except at station 4+00 where it was 127.1 ft. Apparently, settlement of the crest has not been as much as anticipated. Photo No. 3 shows the crest.
 - (4) Downstream Slope. The downstream slope is very well vegetated with adapted grasses. No deformations, slumps, slides, rodent holes or seepage were observed on the slope, along the toe or below the toe of the dam. There wasn't any sign of seepage into the scour hole of the pipe spillway, which is unusual. Measurements indicate that the downstream slope is flatter than shown on the plans. Photo No. 4 shows the downstream slope.

- (5) Miscellaneous. The excellent vegetative cover and the nature of the materials in the embankment indicate that this dam could withstand considerable overtopping without serious damage.

c. Appurtenant Structures.

- (1) The principal spillway is uncontrolled. It consists of a 6' x 2' reinforced concrete drop inlet (riser) connected to a 24-inch reinforced concrete pipe conduit passing through the dam. No signs of deterioration were noted in the riser or the outlet of the conduit. Measurements indicate that it was constructed according to the plans. Photos 5, 6, 7, and 9 show the inlet and outlet of the principal spillway. Flow through the spillway was estimated at 0.5 c.f.s. There is a shear failure (circular arc) on the right side of the scour hole. It is felt that this slide results from the accumulation of surface runoff along the edge of the cultivated field along the right (south) side of the spillway outlet. Photos 8 and 10 show the shear slide on the right side of the scour hole. No seepage was observed into or around the scour hole. The reservoir level was at the crest of the spillway when inspected.
- (2) The uncontrolled emergency spillway is cut through the left abutment. The spillway is very well vegetated. No slumps, slides or erosion was observed in the spillway. Measurements indicate that it was constructed according to the plans. There were no indications that the emergency spillway has operated. Spillway flows should not endanger the embankment. Photos 11 and 12 show the emergency spillway.
- (3) Drawdown Facilities. There are no drawdown facilities for this dam.

- d. Reservoir Area. No significant erosion was observed around the shoreline. The shoreline supports a lush growth of tules and grasses. Photo No. 5 shows a portion of the reservoir.

- e. Downstream Channel. The downstream channel appears to be stable. It is overgrown with trees and brush. Photo No. 8 shows the channel.

3.2 EVALUATION

This dam appears to be in excellent condition with no observable potential of failure. Safety factors against shear failure should be significantly higher than reported since slopes are flatter than shown in the plans. The flatter slopes do not appear to be the result of settlement and spreading since the crest elevations are generally

as constructed and there were no observable deformations on the slopes. Apparently, the slope design was modified during construction. There are no indications of any seepage on the downstream slope, along the toe or in the abutment troughs. Slumps and slides on the right side of the scour hole should be corrected, but they do not impair the integrity of the dam.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

There are no controlled outlet works for this dam. The pool level is controlled by rainfall, infiltration, evaporation, and the capacity of the uncontrolled spillways.

4.2 MAINTENANCE OF DAM

The Worth County Soil Conservation District conducts regular inspections of this structure. Maintenance of the structure appears to be very good. Slides in the scour hole (stilling basin) should be stabilized, but they do not pose any threat to the safety of the dam.

4.3 MAINTENANCE OF OPERATING FACILITIES

No operating facilities exist at this dam.

4.4 DESCRIPTION OF ANY WARNING SYSTEM IN EFFECT

There is no warning system in effect for this dam.

4.5 EVALUATION

This dam is very well maintained. The few small trees and brush should be removed from the upstream slope and the slides in the scour hole at the downstream end of the principal spillway should be stabilized.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES

- a. Design Data. Plans for this dam were obtained from the Grant City Soil Conservation Service office.
- b. Experience Data. The drainage area, reservoir surface area, and elevation-storage data were obtained from the plans. The hydraulic computations for the spillway and dam overtopping discharge ratings were based on data collected in the field at the time of the field inspection, and data obtained from the plans.
- c. Visual Observations.
 - (1) The principal spillway riser weir and trash rack are in good condition. There is some heavy grass growing over the weir (see Photo No. 6) that could be cleaned off, but there is no heavy debris. The sloughing on the right side of the outlet stilling basin poses no problem at the present time but bears watching for further developments.
 - (2) The emergency spillway is in very good shape and has an excellent grass cover.
 - (3) There are no drawdown facilities to evacuate the pool.
- d. Overtopping Potential. The spillways are too small to pass the probable maximum flood without overtopping. The spillways will pass 65% of the probable maximum flood and the 1% probabilistic flood without overtopping. The results of the routings through the dam are tabulated in regards to the following conditions:

Frequency	Inflow Discharge c.f.s.	Outflow Discharge c.f.s.	Maximum Pool Elevation	*Maximum Depth Over Dam Feet	Duration Over Top Hours
1/2 PMF	960	800	126.5	0	---
PMF	1920	1720	128.0	.9	.4
0.65 PMF	1240	1080	127.1	0	---

* Minimum Top of Dam Elevation - 127.1

According to the recommended guidelines from the Department of the Army, Office of the Chief of Engineers, this dam is classified as having a high hazard rating and a small size. Therefore, the 1/2 PMF to PMF is the test for the adequacy of the dam and its spillway.

The estimated damage zone is described in Paragraph 1.2d in this report.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

- a. Visual Observation. This dam is in excellent condition and is considered to be structurally stable. Measurements indicate that the embankment slopes are flatter than shown on the plans. There are no indications of seepage on the downstream side of the dam. Minor deficiencies in maintenance, small trees and shrubs on the upstream slope and slides on the right bank of the scour hole could lead to problems if left uncontrolled:
- b. Design and Construction Data. Design data and analyses and reports on construction control are considered adequate to support the conclusions in this report.
- c. Operating Records. There are no controlled operating facilities for this dam.
- d. Post Construction Changes. The inspection team is not aware of any post-construction changes.
- e. Seismic Stability. This dam is located in Seismic Zone 1. An earthquake of the magnitude predicted in this area is not expected to cause structural failure of this dam.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

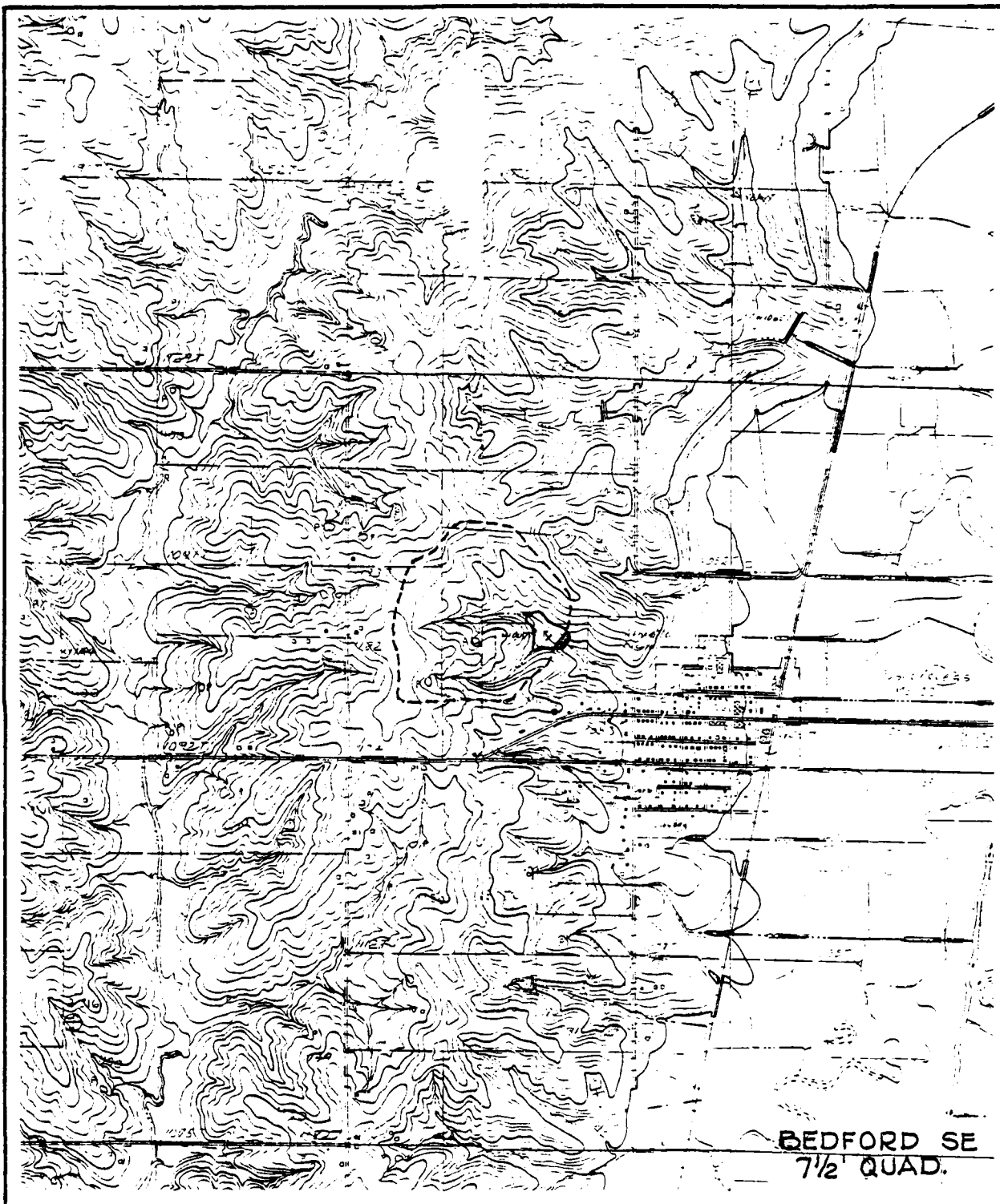
7.1 DAM ASSESSMENT

- a. Safety. This dam is considered to be structurally safe and hydrologically adequate. The spillways will pass 65% of the probable maximum flood without overtopping the dam and the probable maximum flood will overtop the dam by 0.9 foot for 0.4 hour which should not result in significant damage to the dam. Small trees and brush should be removed from the upstream slope and measures taken to stabilize the slides in the right bank of the scour hole.
- b. Adequacy of Information. Information available on design of this structure, visual observations, and 19 years of satisfactory performance are considered adequate to support conclusions in this report.
- c. Urgency. There does not appear to be any urgency to accomplish the remedial measures recommended in paragraph 7.2.
- d. Necessity for Further Investigations. Further investigations are not considered necessary.
- e. Seismic Stability. This dam is located in Seismic Zone 1. An earthquake of this magnitude is not expected to be hazardous to this dam.

7.2 REMEDIAL MEASURES

- a. Alternatives.
 - (1) No modifications are considered necessary.
- b. Operation and Maintenance Procedures.
 - (1) Trees and brush should be removed from the upstream slope and measures taken to prevent their recurrence. Removal of large trees should be done under the guidance of a professional engineer experienced in the design and construction of dams.
 - (2) The activity and extent of the slides in the right bank of the scour hole should be monitored. Measures to eliminate the ponding of surface runoff in the area above the slide should facilitate stabilization of the slide area.
 - (3) Regular inspections of the structure should be continued with the reports made a part of this project file.

APPENDIX A
MAPS



Scale in feet
2000 1000 0 2000 4000

Contour Interval - 20'



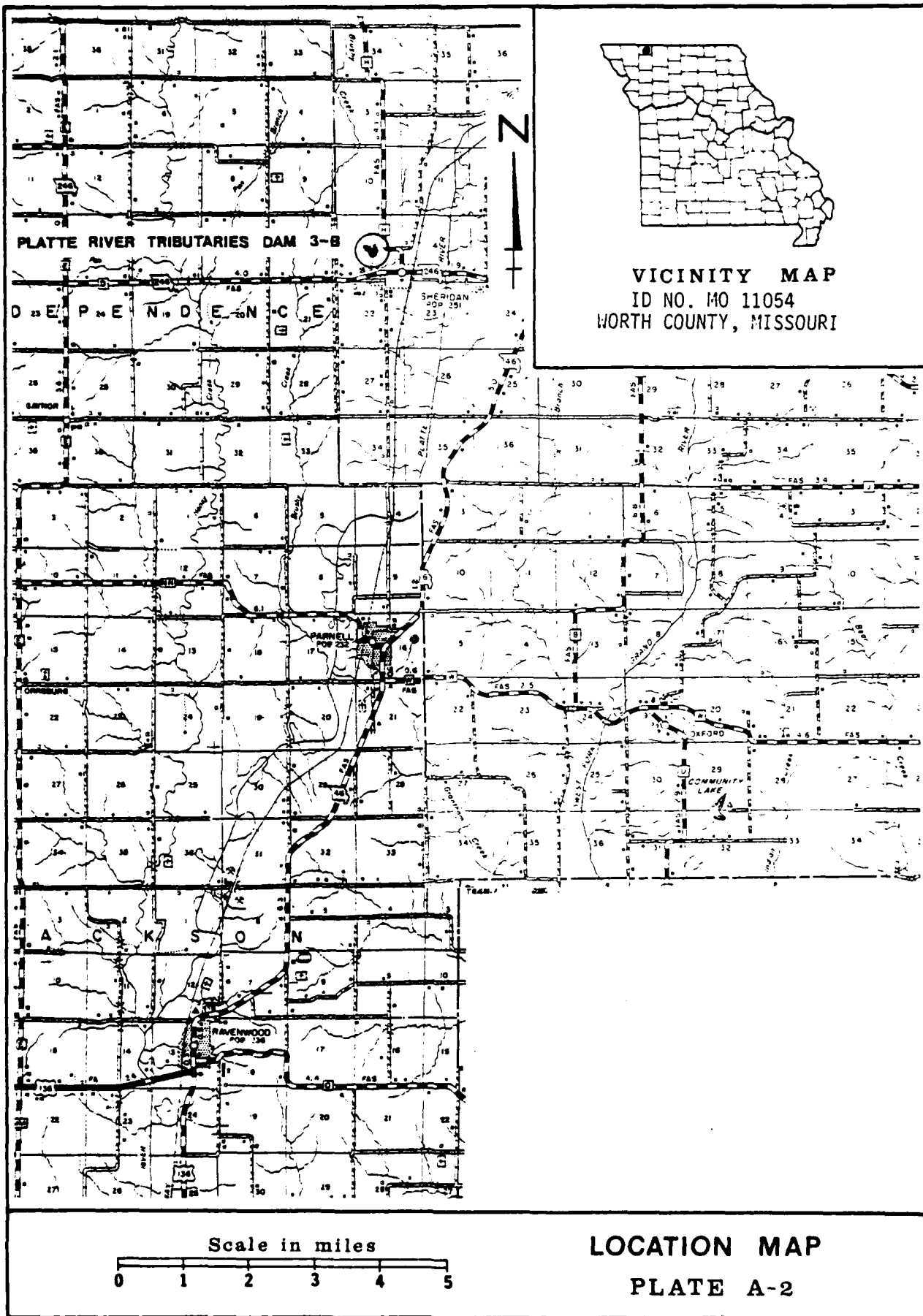
VICINITY TOPOGRAPHY

PLATTE RIVER TRIBUTARIES DAM 3-B

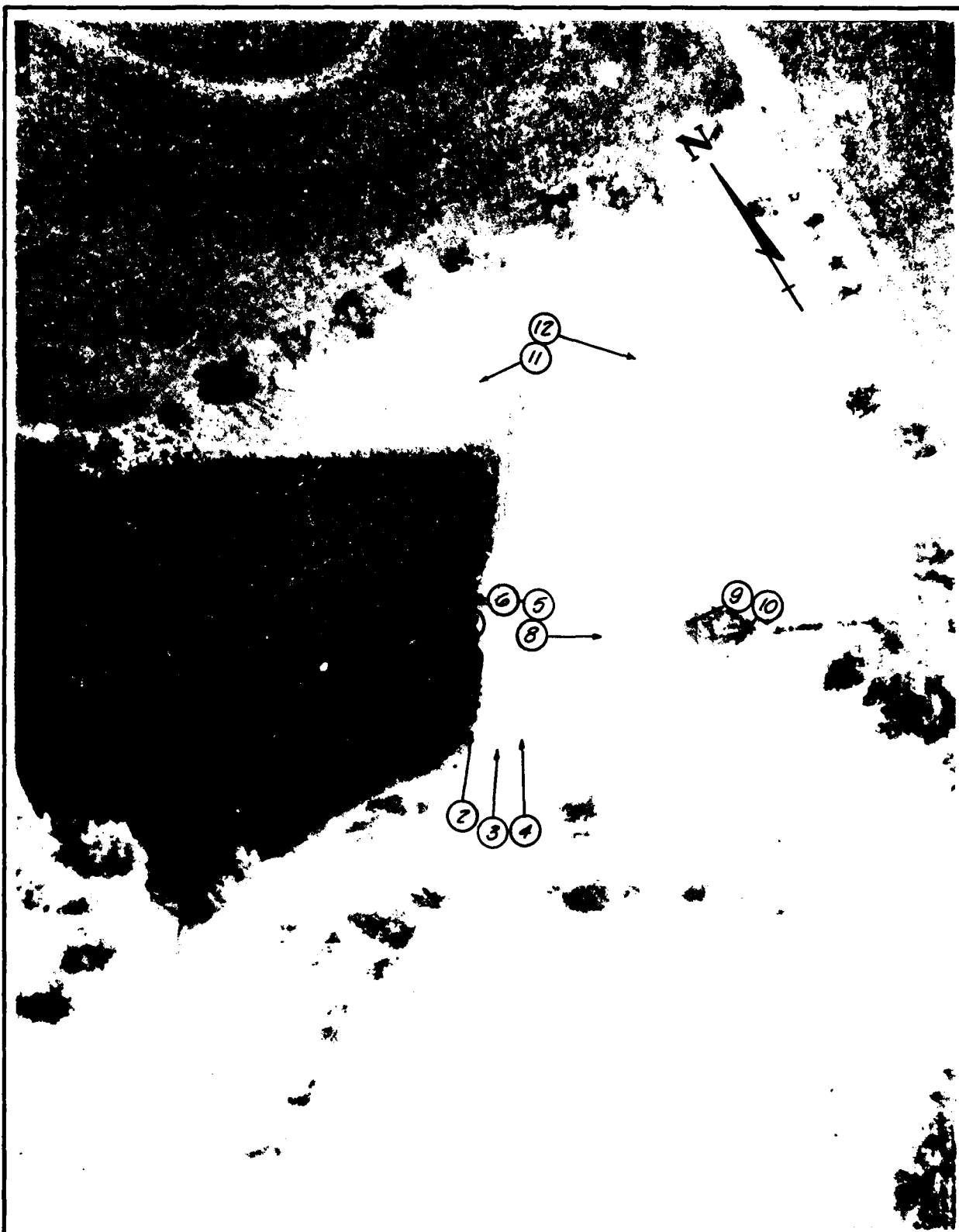
WORTH COUNTY, MISSOURI

MO. 11054

PLATE A-1



APPENDIX B
PHOTOGRAPHS



PLATTE RIVER TRIBUTARIES DAM 3-B
WORTH COUNTY, MISSOURI
MO 11054

PHOTO INDEX

PLATE B-1

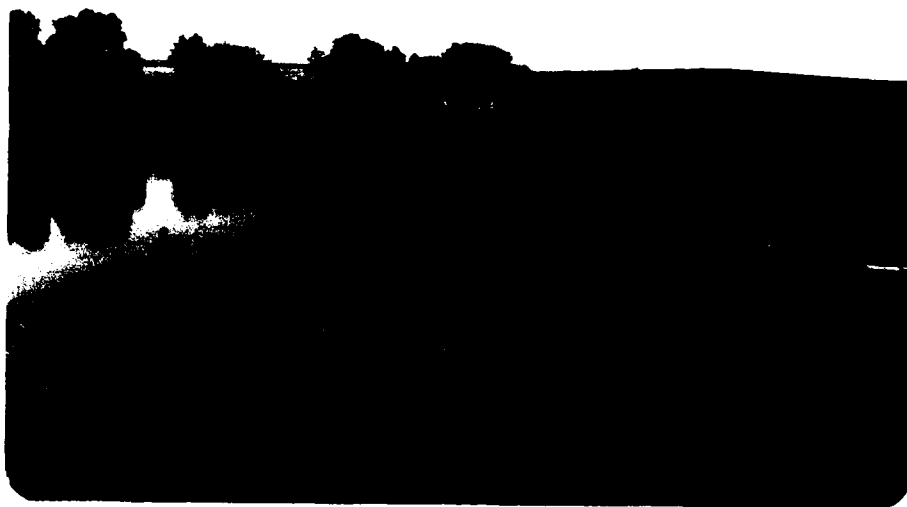


PHOTO NO. 2 - UPSTREAM SLOPE FROM RIGHT END.



PHOTO NO. 3 - CREST FROM RIGHT END.



PHOTO NO. 4 - DOWNSTREAM SLOPE FROM RIGHT END.

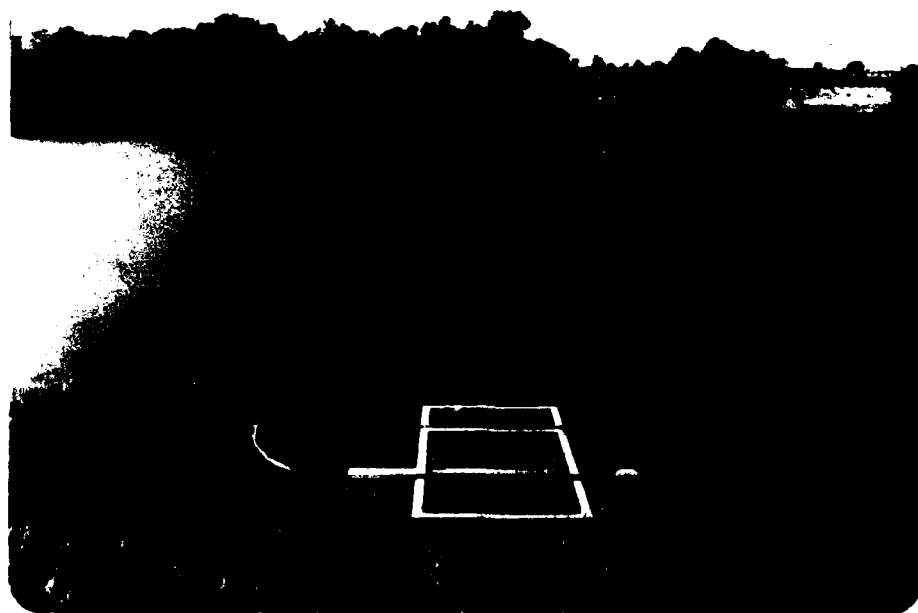


PHOTO NO. 5 - VIEW UPSTREAM WITH PRINCIPAL SPILLWAY INLET IN FOREGROUND.

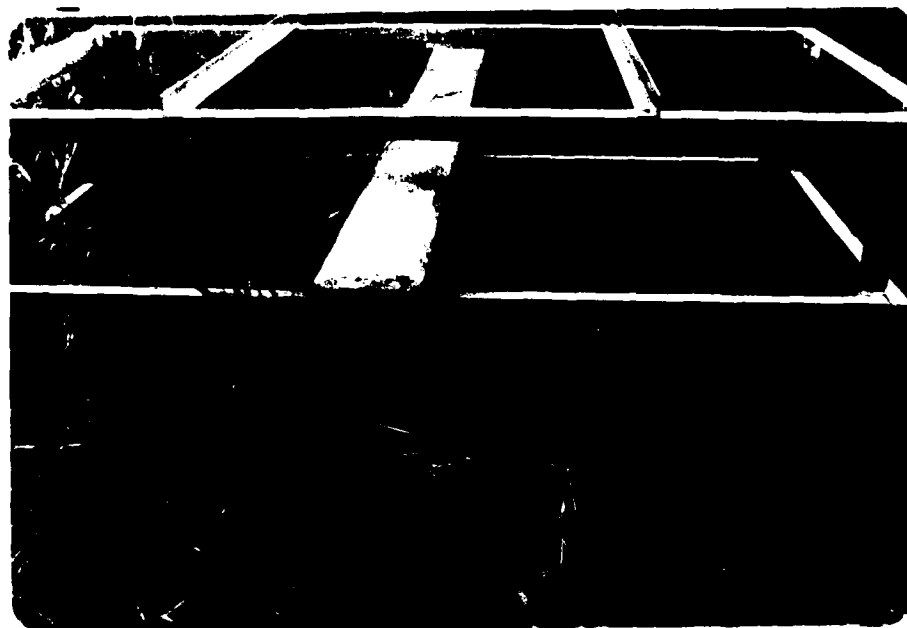


PHOTO NO. 6 - PRINCIPAL SPILLWAY INLET FROM LEFT SIDE.



PHOTO NO. 7 - VIEW LOOKING DOWN INTO PRINCIPAL SPILLWAY INLET.

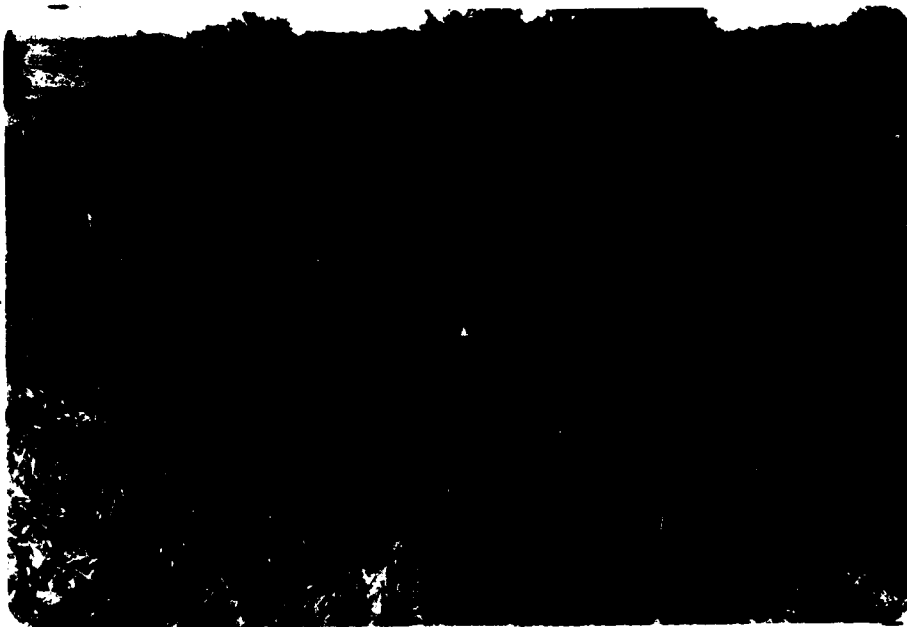


PHOTO NO. 8 - OUTLET END OF PRINCIPAL SPILLWAY SHOWING SLUMP
ON RIGHT SIDE OF SCOUR HOLE.



PHOTO NO. 9 - VIEW OF OUTLET END OF PRINCIPAL SPILLWAY.



PHOTO NO. 10 - SLUMP AREA ON RIGHT SIDE OF SCOUR HOLE.



PHOTO NO. 11 - VIEW UPSTREAM IN EMERGENCY SPILLWAY.



PHOTO NO. 12 - VIEW DOWNSTREAM IN EMERGENCY SPILLWAY.



PHOTO NO. 13 - VIEW LOOKING WEST (UPSTREAM). FOOTBRIDGE
CROSSES CHANNEL. (SEE PLATE A-1)

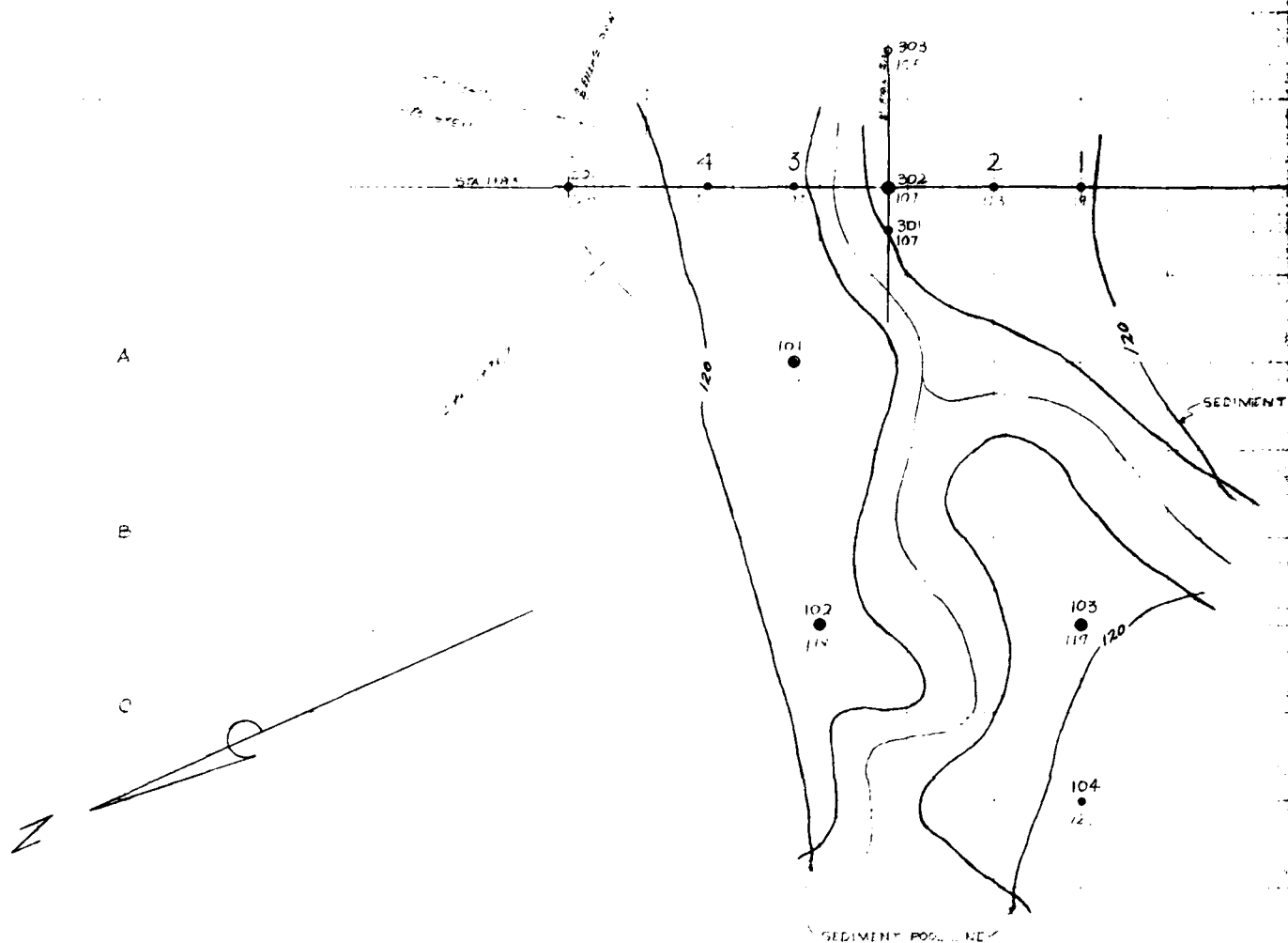


PHOTO NO. 14 - VIEW LOOKING EAST, RIGHT BANK OF CHANNEL
AT LEFT CENTER (SEE PLATE A-1).

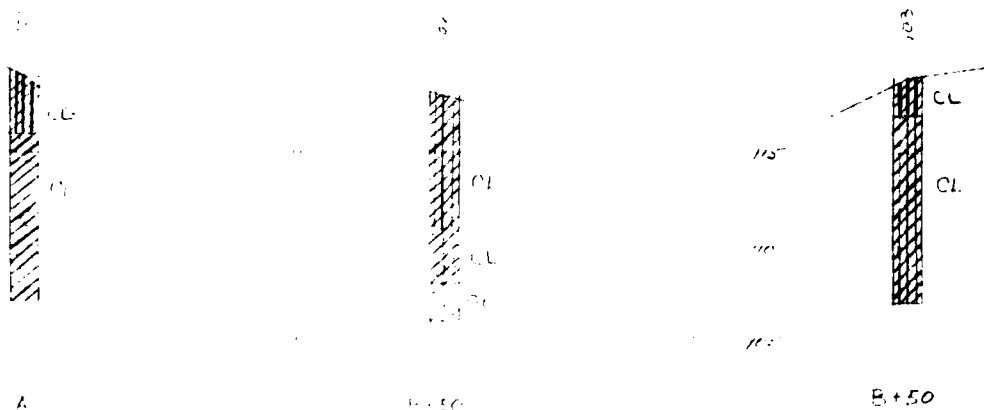


PHOTO NO. 15 - VIEW LOOKING EAST ALONG STREAM CHANNEL ON
RIGHT (SEE PLATE A-1).

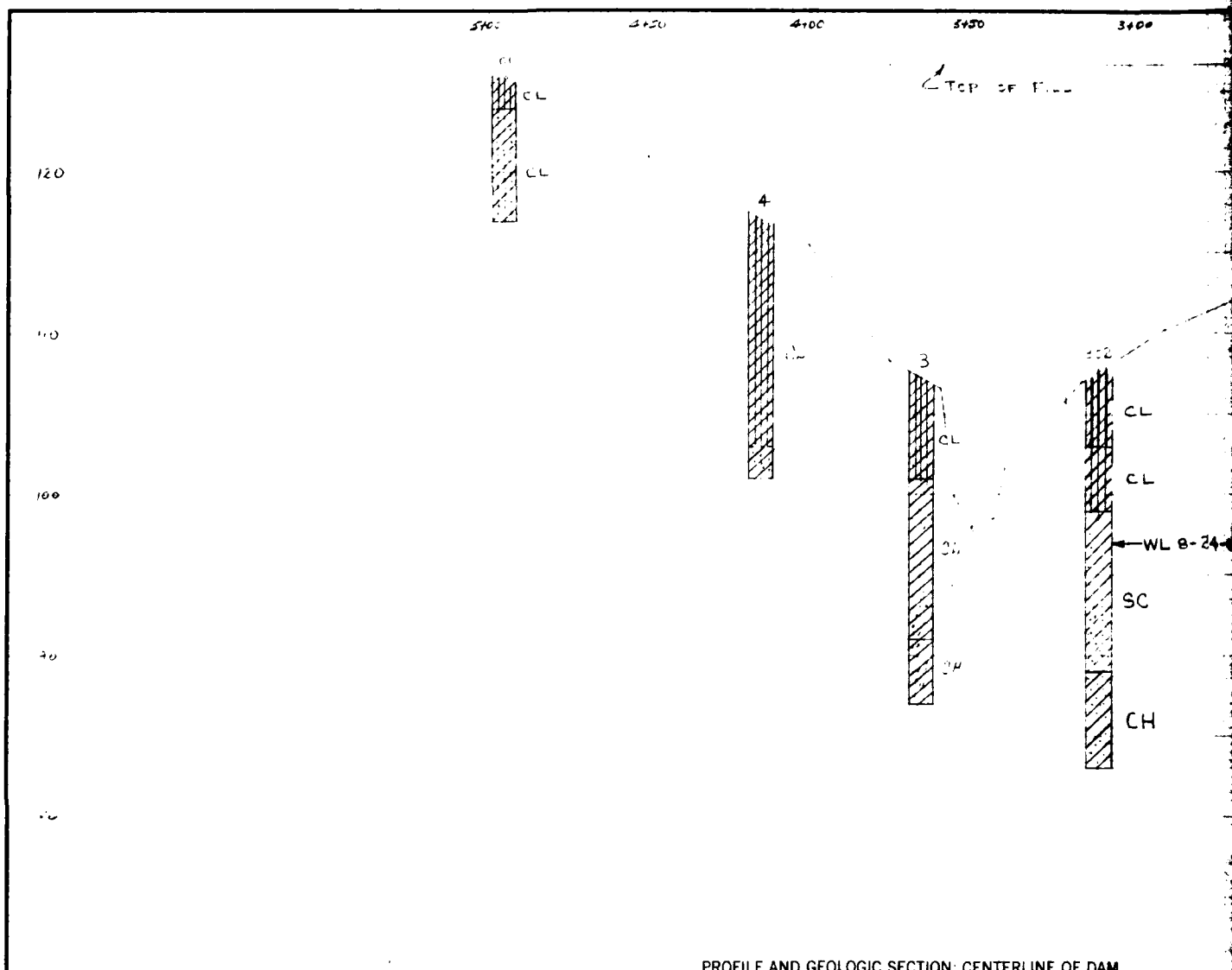
APPENDIX C
PROJECT PLATES



PLAN OF DAM, EMERGENCY SPILLWAY AND BORROW AREA (S)

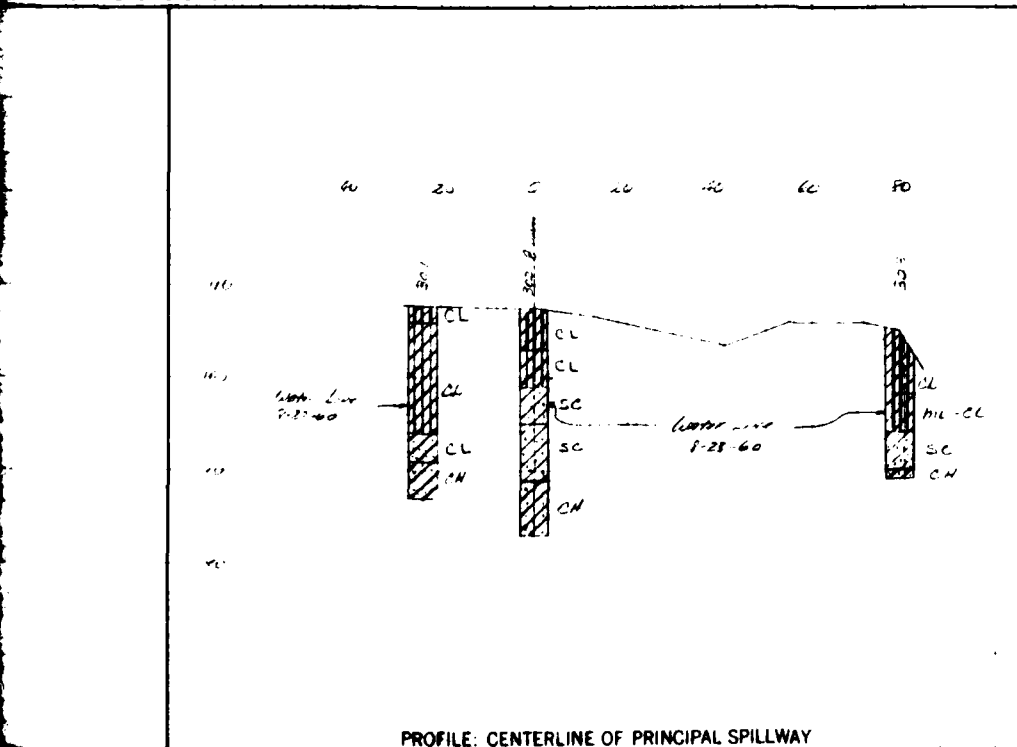
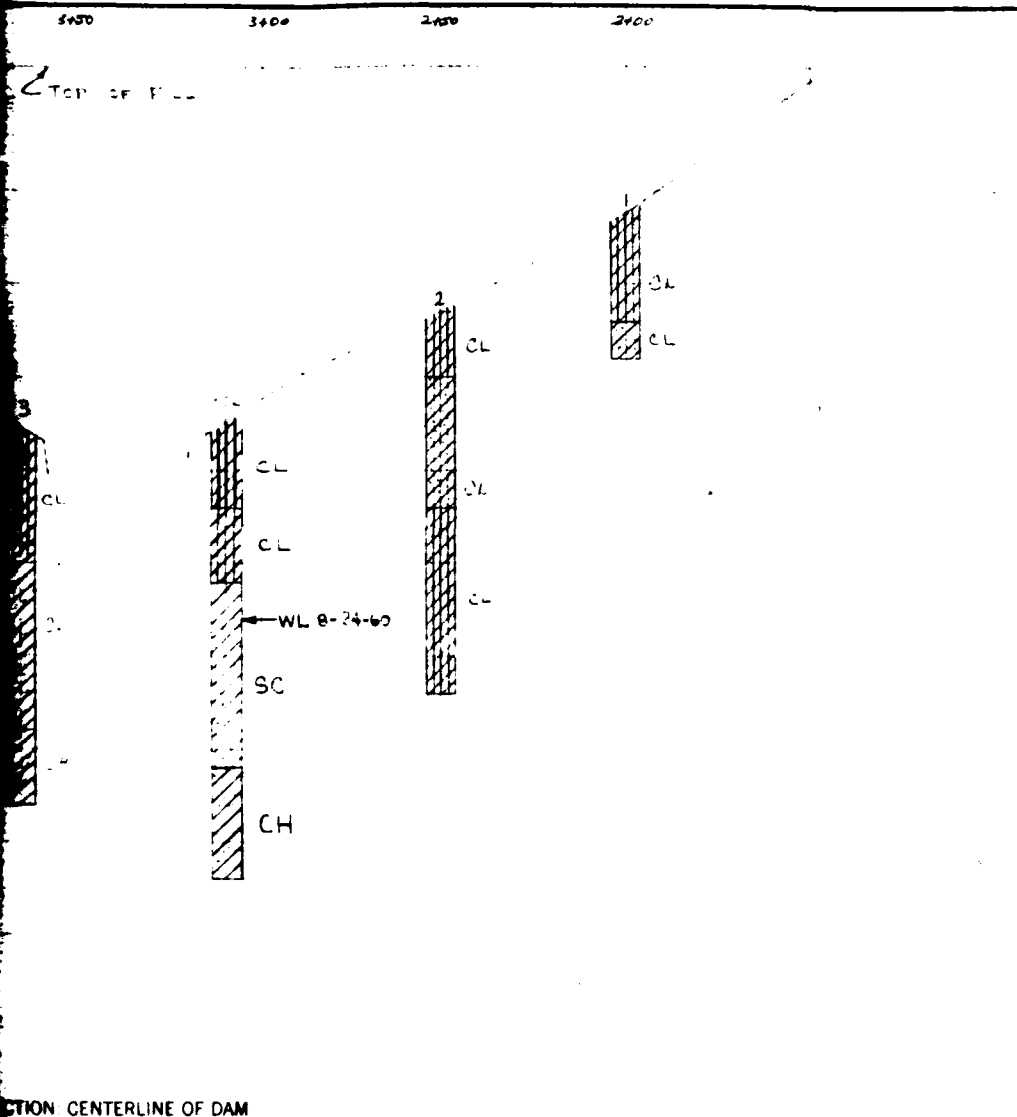


GEOLOGIC CROSS SECTIONS OF BORROW AREA (S)



CROSS SECTIONS OF STREAM CHANNEL

Water Level
8-27-00



LEGEND

SYMBOLS

UNCONSOLIDATED MATERIAL

gravel	sand	silt	clay	cobbles, boulders
gravel, sandy	sand, gravelly	silt, gravelly	clay, gravelly	peat
gravel, silty	sand, silty	silt, sandy	clay, sandy	gypsiferous
gravel, clayey	sand, clayey	silt, clayey	clay, silty	calcareous
gravel, sand, silt	sand, silt, clay	organic silt	organic clay	

* to be added to Standard Symbol when significant amounts of dispersed gypsum or calcified zones are present in the section.

CONSOLIDATED MATERIAL

Sedimentary Rocks

shale	sandstone	limestone	chalk	coal
calcareous shale	calcareous sandstone	cherty limestone	marl	gypsum
sandy shale	shaly sandstone	sandy limestone	chert	conglomerate
siltstone	breccia	dolomite		

Metamorphic Rocks

quartzite	slate
gneiss	schist
marble	soapstone
	talc
	serpentine

Igneous Rocks

intrusive	extrusive
pyroclastic	

Undifferentiated

--

Other Symbols

○ hole logged only
● hole sampled
↖ dip and strike
↗ pit or trench

ABBREVIATIONS

aq aquifer	fr friable
cav. cavities	lam laminated
centerline	mas massive
con concretions	TD total depth
US undisturbed samples	v. very
DS disturbed samples	w/ with
dip dipping	wea weathered
frac fractured	WL (date) groundwater level on a specified date

TEST HOLE NUMBERING SYSTEM

Centerline of dam	1 - 99
Borrow area	101 - 199
Emergency spillway	201 - 299
Centerline of outlet structure	301 - 399
Stream channel	401 - 499
Relief wells	501 - 599
	601 - 699
	701 - 799

UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS

GW	Well graded gravels; gravel-sand mixtures
GP	Poorly graded gravels
GM	Silty gravels; gravel-sand-silt mixtures
GC	Clayey gravels; gravel-sand-clay mixtures
SW	Well graded sands; sand-gravel mixtures
SP	Poorly graded sands
SM-1	Silty coarse sand
SM-2	Silty fine sand
SC	Clayey sands; sand-clay mixtures
ML	Silts, silty v. fine sands; sandy or clayey silts
CL-1	Clays of low plasticity; silty, sandy or gravelly clays
CL-2	Clays of medium plasticity; silty, sandy or gravelly clays
CH	Clays of high plasticity; fat clays
MH	Elastic silts, micaceous or destomaceous silts
OL	Organic silts and organic silty clays of low plasticity
OH	Organic clays or silts of medium to high plasticity

PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS

STRUCTURE #3-B

PLATTE RIV. TRIB. WATERSHED PROJECT

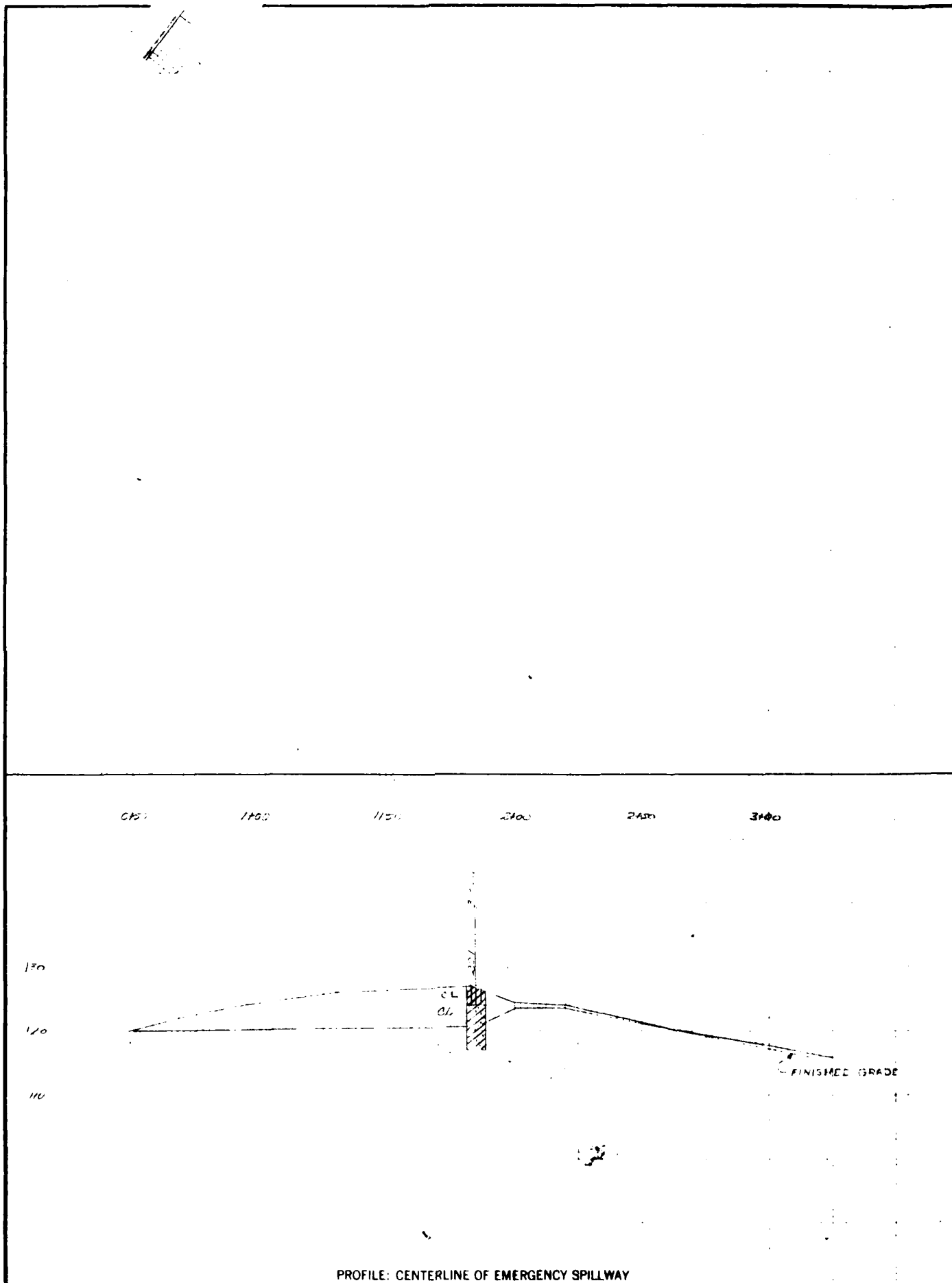
WORTH CO. SCD MISSOURI

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Investigated by	Date	Approved by
O. M. FINKELSON	8-28-60	
Title		Title
GEOLOGIST		
Checked by	Date	
H. H. NOLTE	9-60	
Title		Drawing No.
		3-E-46041-6

PLATE C-2



PROFILE: CENTERLINE OF EMERGENCY SPILLWAY

LEGEND

SYMBOLS UNCONSOLIDATED MATERIAL

	gravel		sand		silt		clay		cobbles boulders
	gravel, sandy		sand, gravelly		silt, gravelly		clay, gravelly		peat
	gravel, silty		sand, silty		silt, sandy		clay, sandy		gypsiferous
	gravel, clayey		sand, clayey		silt, clayey		clay, silty		calcareous
	gravel, sand, silt		sand, silt, clay		organic silt		organic clay		

* to be added to Standard Symbol when significant amounts of dispersed gypsum or calcified zones are present in the section

CONSOLIDATED MATERIAL Sedimentary Rocks

	shale		sandstone		limestone		chalk		coal
	calcareous shale		calcareous sandstone		cherty limestone		marl		gypsum
	sandy shale		shaley sandstone		sandy limestone		chert		conglomerate
	siltstone		breccia		dolomite				

Metamorphic Rocks

	quartzite		slate
	gneiss		schist
	marble		soapstone
			talc
			serpentine

Igneous Rocks

	intrusive		extrusive
	pyroclastic		
	undifferentiated		

Other Symbols

- hole logged only
- hole sampled
- ↖ dip and strike
- pit or trench

ABBREVIATIONS

aq aquifer	tr true
cav. cavities	lam laminated
cl centerline	mas massive
con concretions	TD total depth
US undisturbed samples	v. very
DS disturbed samples	w/ with
dip dipping	wea weathered
frac fractured	WL (date) groundwater level on a specified date

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UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS

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SP	Poorly graded sands
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ML	Silts; silty, v. fine sands; sandy or clayey silts
CL	Clays of low to medium plasticity; silty, sandy or gravelly clays
CH	Inorganic clays of high plasticity; fat clays
MH	Elastic silts; micaceous or diatomaceous silts
OL	Organic silts and organic silty clays of low plasticity
OH	Organic clays of medium to high plasticity

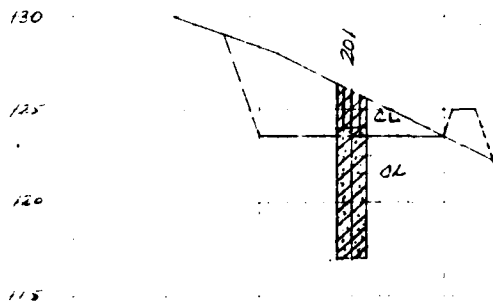
PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS
STRUCTURE #3-B
 PLATTE RIV. TRIB. WATERSHED
 WORTH CO. S.C.D. MISSOURI

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Investigated by D.M. FINNELSON	Date 8-21-60	Approved by _____
Title GEOLOGIST		Title _____
Checked by B.H. NOLTE	Date 8-24-60	Title _____
Title AGRI. ENGINEER	Project No. 3-E-46041-6	Sheet No. 11

GEOLOGIC CROSS SECTIONS OF EMERGENCY SPILLWAY

20 25 0 26 50



Sta - 1+82

PLAN AND PROFILES FOR GEOLOGIC INVESTIGATIONS

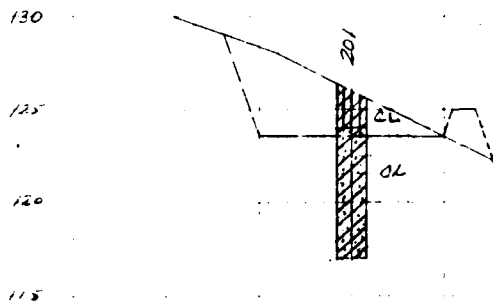
STRUCTURE #3-B
 PLATTE RIV. TRIB. WATERSHED
 WORTH CO. S.C.D. MISSOURI

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

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GEOLOGIC CROSS SECTIONS OF EMERGENCY SPILLWAY

20 25 0 26 50

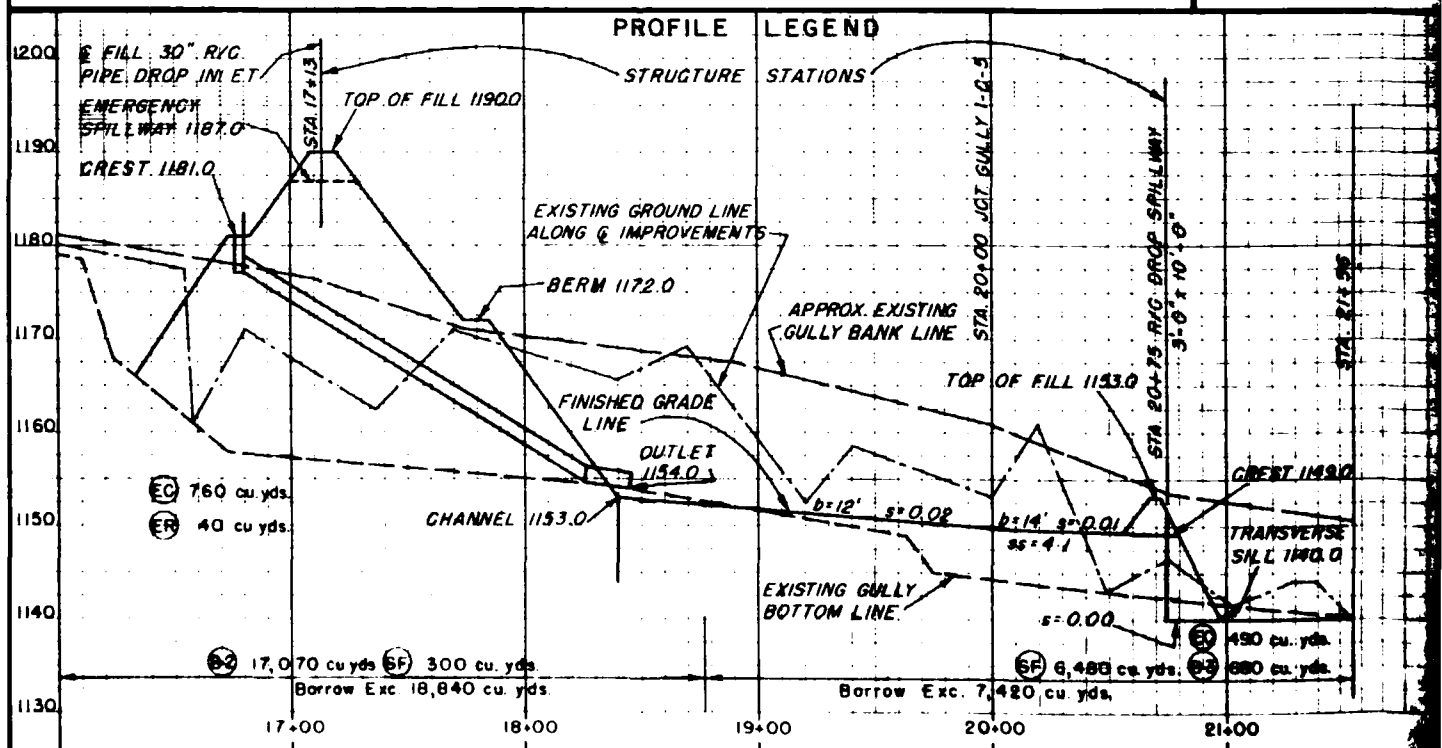


Sta - 1+82

LEGEND

State Line	-----	Levee	=====
County Line	-----	Clearing and/or Grubbing Boundary	-----
Township Line	-----	Building	-----
Section Line	-----	School	-----
Property Line	-----	Church	-----
Paved Road	-----	Cemetery	-----
Improved Road	-----	Windmill	-----
Dirt Road	-----	Well	-----
Private or Field Road	-----	Spring	-----
Railroad	-----	Mine, Quarry, or Gravel Pit	-----
Base Line	-----	Section Corner	-----
Offset Line	-----	Section Center	-----
Center Line of Improvements	-----	Bench Mark, Permanent	-----
Watershed Boundary	-----	Bench Mark, Temporary	-----
Sub-Watershed Boundary	-----	Control Point, Permanent	-----
Fence	-----	Control Point, Temporary	-----
Fence to be Removed	-----	Point on Offset Line	-----
Telegraph and Telephone Line (Location of Pole)	-----	Point of Intersection	-----
Power Line (Location of Pole)	-----	Lake or Pond	-----
Telephone and Power Line (Location of Pole)	-----	Intermittent Lake or Pond	-----
High Voltage Transmission Line (Location of Towers)	-----	Approximate Limit of Work Area	-----
Pipe Line or Buried Cable	-----	Stock Watering System	-----
Water Pipe Line (Farm)	-----	Foundation Trench Drain	-----
Existing Tile Line	-----	*Contours	-----
Proposed Tile Line	-----	*Gully Banks	-----
Junction Box	-----		-----
Open Ditch (4' deep or over)	-----		-----
Shallow Ditch (Less than 4' deep)	-----		-----
Open Ditch to be Cleaned Out	-----		-----
Terrace, Graded	-----		-----
Terrace, Level	-----		-----
Diversion	-----		-----
Grassed Watercourse	-----		-----
Stream (Large)	-----		-----
Stream (Small)	-----		-----
Intermittent Stream	-----		-----
Stream Disappears on Flat	-----		-----
Stream Disappears in Sink Hole	-----		-----
Sink Hole or Depression	-----		-----
Marsh	-----		-----

1 gravel	6	26 shale	30
2 gravel, sandy	7	27 calcareous shale	31
3 gravel, silty	8	28 sandy shale	32
4 gravel, clayey	9	29 siltstone	33
5 gravel, sand, silt	10		
* to be added to Standard calclified zones are pred			
Metamorphic Rocks			
46 quartzite	49		
47 gneiss	50		
48 marble	51		
TEST HOLE NUMBERING			
Centerline of dam			
Barrow area			
Emergency spillway			
Centerline of outlet structure			
Stream channel			
Relief wells			
UNIFIED			
GW Well graded gravels, gravel			
GP Poorly graded gravels			
GM Silty gravels, gravel-sand			
GC Clayey gravels, gravel-sand			
SW Well graded sands, sand			
SP Poorly graded sands			
SM Silty sand			
SC Clayey sands, sand-clay			



SOIL BORING SYMBOLS

UNCONSOLIDATED MATERIAL

1 gravel	6 sand	11 silt	16 clay	21 cobbles, boulders
2 gravel, sandy	7 sand, gravelly	12 silt, gravelly	17 clay, gravelly	22 peat
3 gravel, silty	8 sand, silty	13 silt, sandy	18 clay, sandy	23 gypsiferous
4 gravel, clayey	9 sand, clayey	14 silt, clayey	19 clay, silty	24 calcareous
5 gravel, sand, silt	10 sand, silt, clay	15 organic silt	20 organic clay	25

* to be added to Standard Symbol when significant amounts of dispersed gypsum or calcified zones are present in the section

CONSOLIDATED MATERIAL

Sedimentary Rocks

26 shale	30 sandstone	34 limestone	38 chalk	42 coal
27 calcareous shale	31 calcareous sandstone	35 cherty limestone	39 marl	43 gypsum
28 sandy shale	32 shaley sandstone	36 sandy limestone	40 chert	44 conglomerate
29 siltstone	33 breccia	37 dolomite	41	45

Metamorphic Rocks

46 quartzite	49 slate
47 gneiss	50 schist
48 marble	51 soapstone, talc, serpentine

Igneous Rocks

52 intrusive	54 extrusive
53 pyroclastic	55

Undifferentiated

56

TEST HOLE NUMBERING SYSTEM

Centerline of dam	1-99
Borrow area	101-199
Emergency spillway	201-299
Centerline of outlet structure	301-399
Stream channel	401-499
Relief wells	501-599
	601-699
	701-799

OTHER SYMBOLS

Typical Soil Boring

1 hole logged only

104 hole sampled

dip and strike

pit or trench

WL (date) groundwater level on a specified date

GP 1

GM 3

SP 5

SC 7

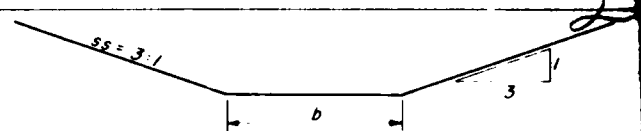
9 WL (4-10-59)

TYPICAL LOG
Use either description, number or symbol of the Soil Type.

UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS

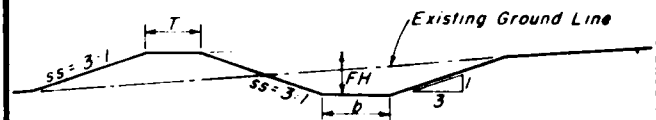
GW Well graded gravels; gravel-sand mixtures	ML Silts; silty, v. fine sands; sandy or clayey silts
GP Poorly graded gravels	CL Clays of low to medium plasticity, silty, sandy or gravelly clays
GM Silty gravels; gravel-sand-silt mixtures	CH Inorganic clays of high plasticity, fat clays
GC Clayey gravels; gravel-sand-clay mixtures	MH Elastic silts; micaceous or diatomaceous silts
SW Well graded sands; sand-gravel mixtures	OL Organic silts and organic silty clays of low plasticity
SP Poorly graded sands	OM Organic clays of medium to high plasticity
SM Silty sand	
SC Clayey sands; sand-clay mixture	

TYPICAL CROSS SECTIONS



IMPROVED DRAINAGEWAYS

CHANNELS, GRADED WATERCOURSES, SOD FLUMES, ETC.



DIVERSIONS & EMERGENCY SPILLWAYS

DEFINITIONS OF TERMS

s- Grade of channel in feet of drop per foot of length
b- Bottom width of channel in feet
ss- Side slope ratio, horizontal to vertical
T- Top width of dike, levee or fill in feet
FH- Fill height of dike in feet (vertical distance from bottom of channel to top of dike)

TABLE OF STANDARD DIMENSIONS

IMPROVEMENT	T	ss
Improved Drainageways	-	3:1 or As shown on drawings
Diversions	6'	3:1 or As shown on drawings
Levees	8'	3:1 or As shown on drawings
Drop Inlet Embankments	10'	3:1 or As shown on drawings
Chute Embankments	8'	3:1 or As shown on drawings
Drop Spillway Embankments	8'	3:1 Upstream-2:1 Downstream

NOTE:

1. Use standard dimensions unless otherwise shown on drawings
2. Use s, b, and FH as shown on drawings

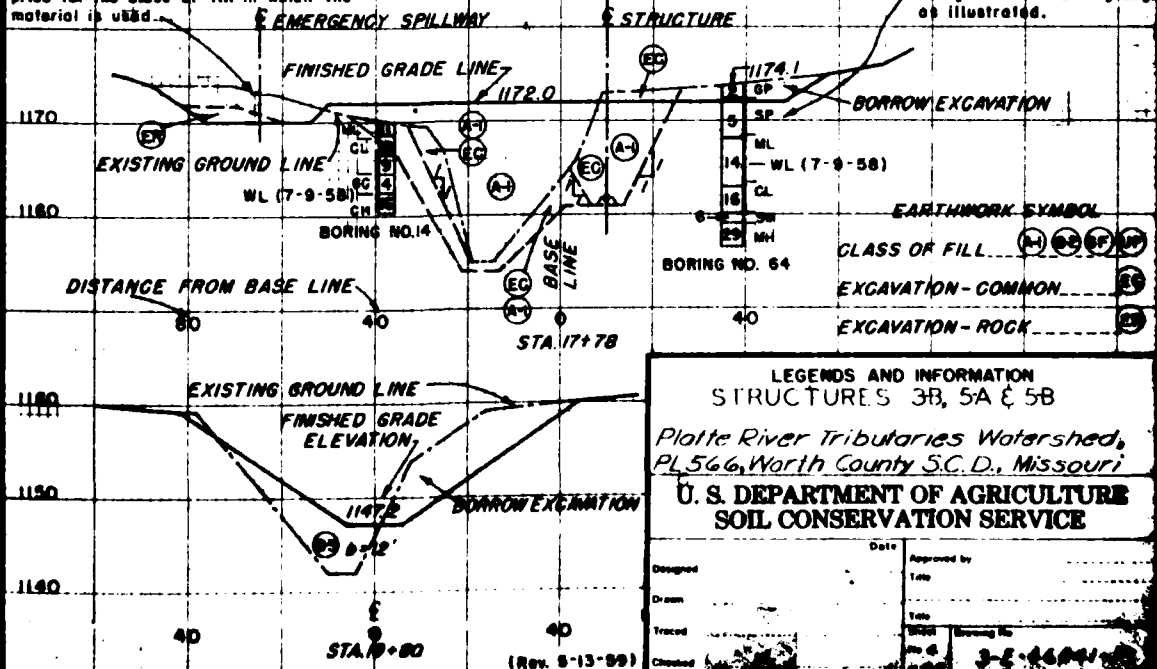
GENERAL NOTES

Improvements are along Base Line unless otherwise indicated
Elevations of pipes refer to invert elevations
Cross sections shown as looking downstream
Lines showing limits of structure excavation are on a 1:1 slope unless otherwise indicated

CROSS SECTION LEGEND

Note: Excavation when not labeled will be paid for at the contract price for the class of fill in which the material is used.

Note: Unified Soil Classification Symbols shall be shown along with Soil Boring Log as illustrated.



LEGENDS AND INFORMATION

STRUCTURES 3B, 5A & 5B

Platte River Tributaries Watershed,
PL 566, North County S.C.D., Missouri

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date	Approved by
Drawn		Title
Traced		Title
Checked		Title

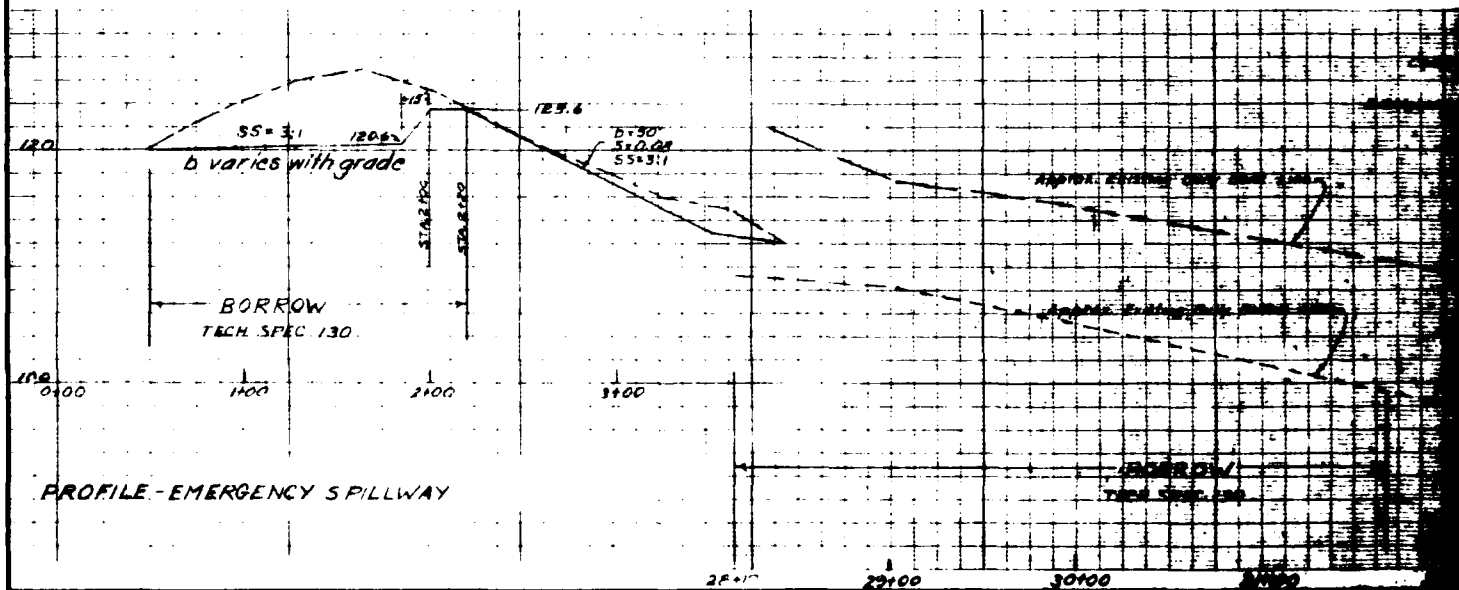
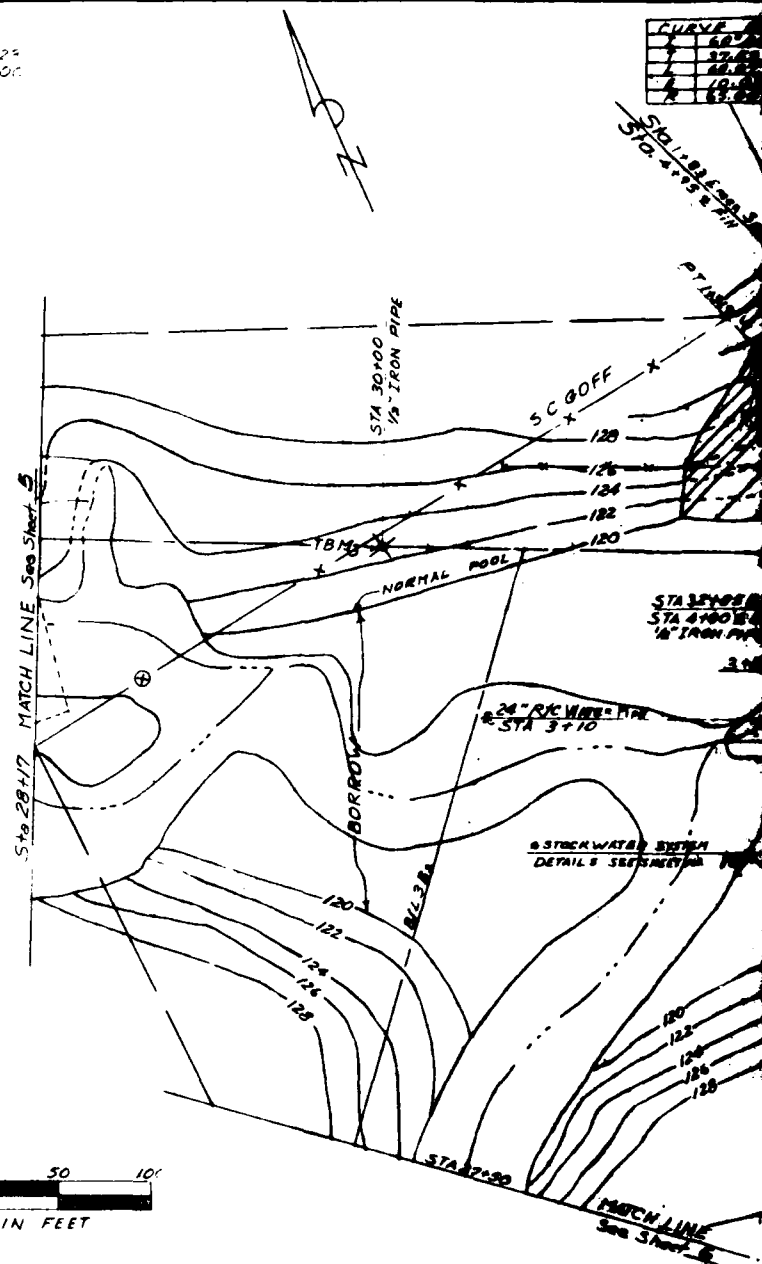
TBM 1/2 IF 5' - 1' STA 30+00 Elev 106.25
 TBM 1/2 IF 5' - 1' STA 30+00 Elev 123.00

CURVE	PC	PT	PI	EA	EB
1	28+17.5	30+00	29+08.75	123.00	123.00
2	30+00	31+17.5	30+58.75	123.00	123.00

CLEARING & GRUBBING SIZE (DIAM)	NUMBER
3'-6"	205
6'-9"	189
9'-12"	109
12'-15"	37
15'-18"	15
18'-24"	10
24'-30"	7
30'-36"	2
60'+	2

GRUBBING STUMPS SIZE (DIAM)	NUMBER
3'-6"	6
6'-9"	6
9'-12"	1
15'-18"	1
24'-30"	3

CLEARING AND GRUBBING OF
 BRUSH SMALLER THAN 3 INCH
 DIAM. SHALL BE CONSIDERED
 INCIDENTAL TO THE JOB AND
 WILL NOT BE COUNTED.

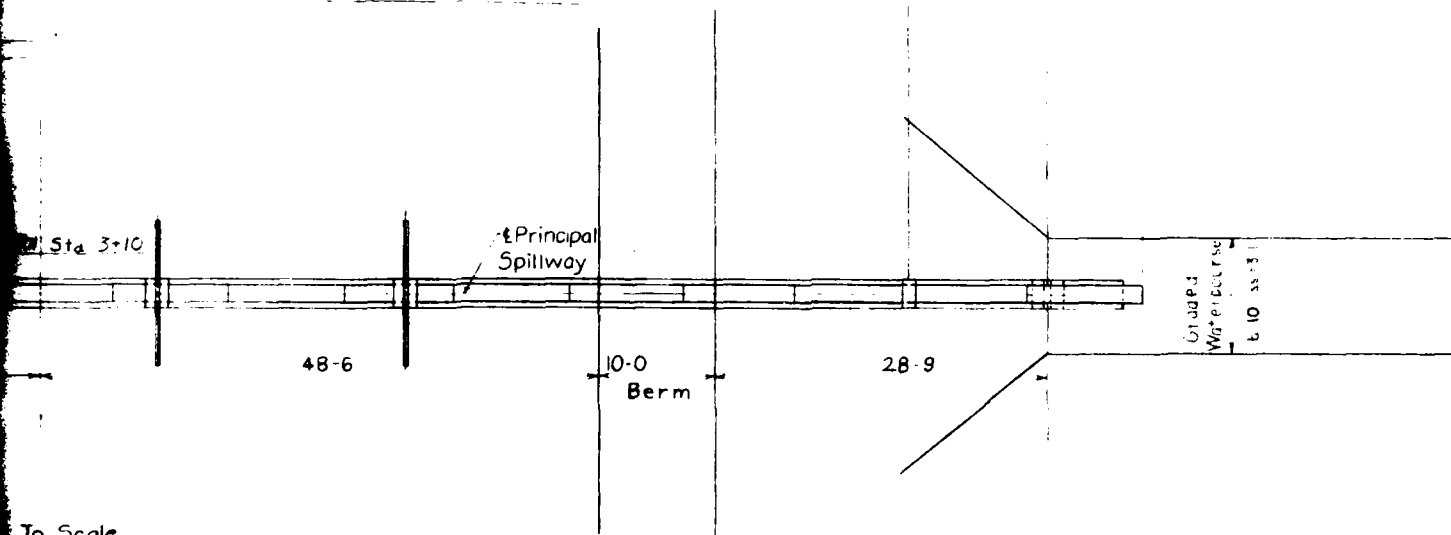


For Data See Sheets 23, 27, 28

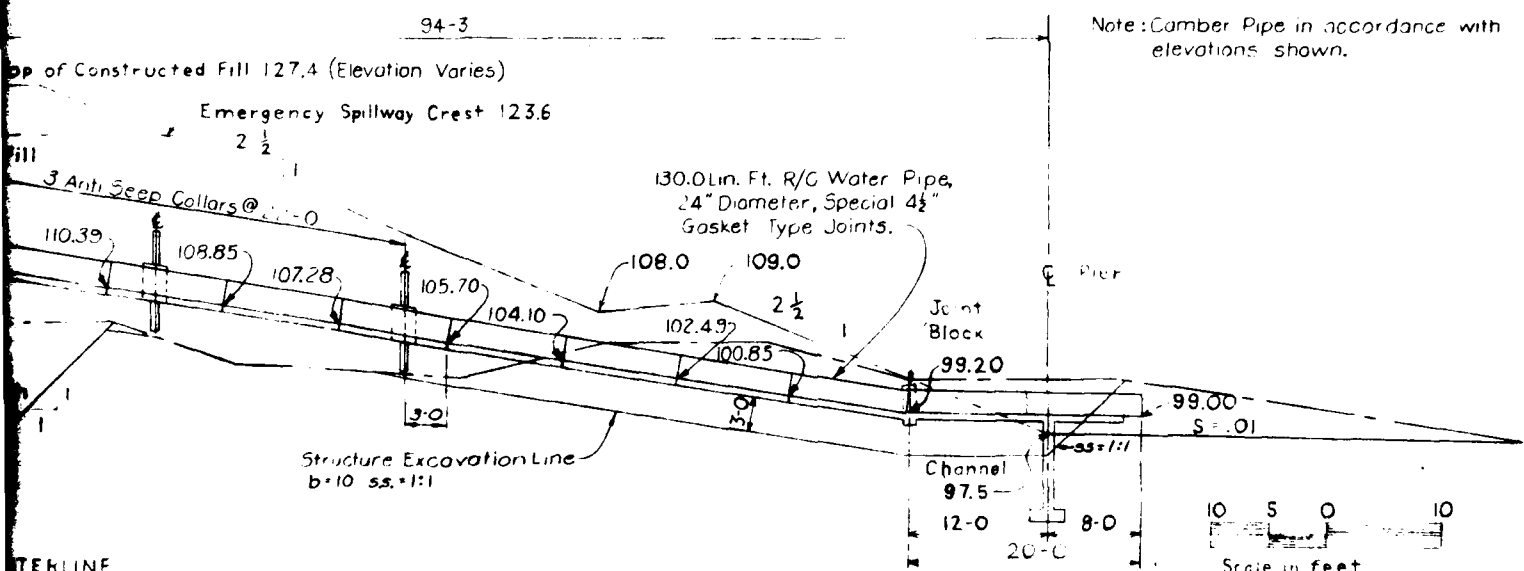
For Data See
Sheets
21, 28

Sta. 32+85
Fill Sta 4+00

Baseline 3-B.



To Scale



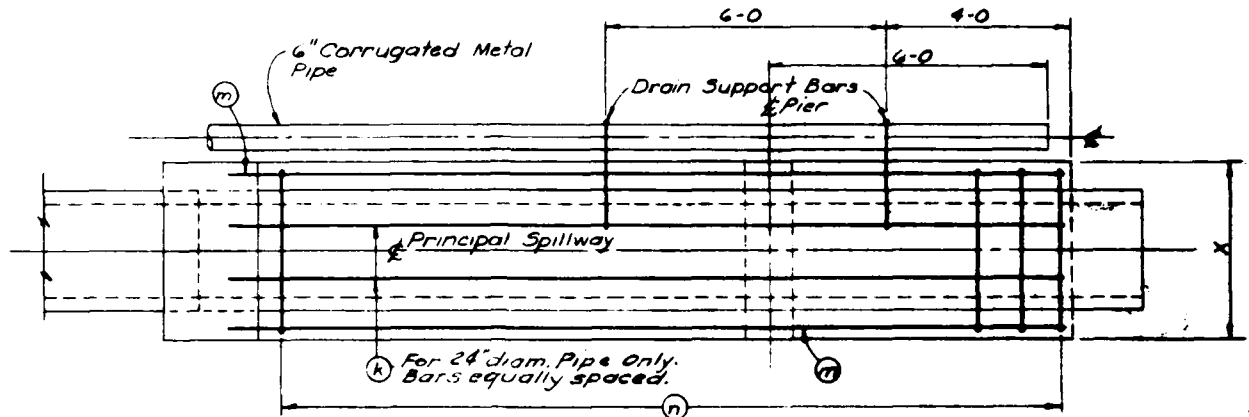
TERLINE

28.9 Cu. Yds.
1,305 Pounds
130.0 Lin. Ft.
Part Job
41 Cu. Yds.

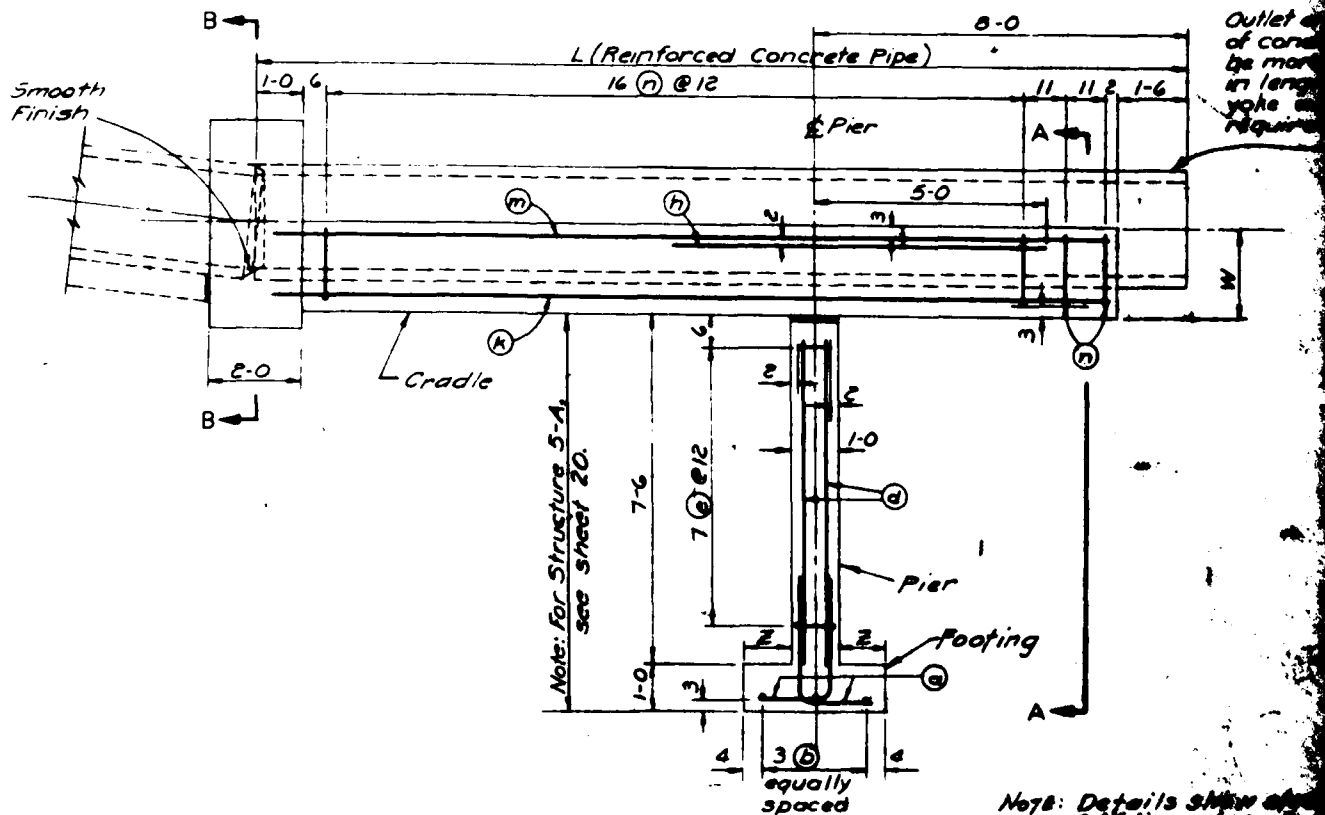
STRUCTURE 3-B BASELINE STA. 32+85	
R/C DRAIN INLET FOR 24" DIAM. PIPE GENERAL LAYOUT Platte River Tributaries Watershed Washington County, S.C.D., Missouri, PL. 566	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Designed: H. J. ... Drawn: Townsend C. Deriso Traced: W. N. Riggs	Date: 6-60 Title: 2-8-6
Checked: Townsend	Sheet No. 8 Drawing No. 3-E-46041-P

PLATE C-6 Form 820-313 (November 1959)

NOTE: Corrugated Metal Pipe and drain support bars to be used only when shown on the General Layout. (One or both sides of principal spillway).

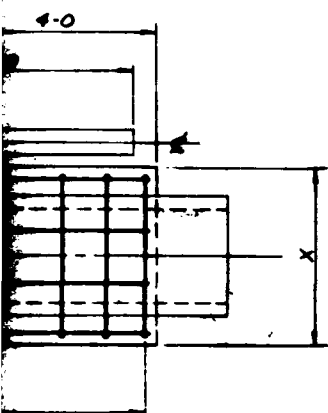


PLAN

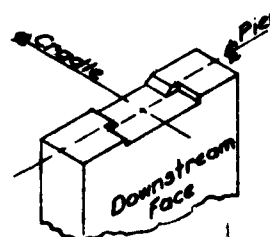


SIDE ELEVATION

NOTE: Details shown are for 24" diam. pipe. For other diam. pipe see structure 5-A, see sheet 20.

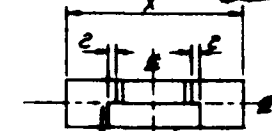


STEEL SCHEDULE																
Pipe Diameter	18"										24"					
Location	Mark	Type	Size	Quan	Length	A	B	C	Total	Size	Quan	Length	A	B	C	Total
Footing & Pier	a	3	#4	6	3'-9"	2'-6"	1'-3"		22'-6"	#4	8	4'-0"	2'-6"	1'-6"		32'-0"
Footing	b	1	"	3	2'-6"				7'-6"	"	3	3'-0"				9'-0"
Pier	d	1	"	6	7'-0"				42'-0"	"	8	7'-0"				56'-0"
"	e	4	#3	14	4'-3"	1'-5"	0'-8"	1'-5"	59'-6"	#3	14	4'-9"	2'-0"	0'-8"	2'-0"	66'-6"
Cradle	h	1	#5	2	8'-0"				16'-0"	#6	2	8'-0"				16'-0"
"	k	1	#4	2	18'-0"				36'-0"	#4	4	18'-0"				72'-0"
"	m	1	#3	2	18'-0"				36'-0"	#3	2	18'-0"				36'-0"
"	n	4	#4	18	4'-6"	0'-11"	2'-7"	0'-11"	81'-0"	#4	18	5'-9"	1'-3"	3'-2"	1'-3"	103'-6"
Quantities	Steel	#3	39.50 Feet			22.37 Pounds			66.90 Feet			25.0 Pounds				
		#4	183.00 "			126.25 "			272.50 "			122.25 "				
		#5	52.00 "			54.84 "			96.00 "			37.33 "				
		#6	—			—			16.00 "			24.00 "				
		Total	402.9			Pounds			268.6			Pounds				
Concrete			3.53			Cu. Yds.			4.54			Cu. Yds.				
Dimension	L	20'-0"													20'-0"	
	U	3'-11"													4'-6"	
	W	1'-3 1/2"													1'-9"	
	X	2'-11"													3'-8"	
	Z	0'-9"													1'-0"	



ISOMETRIC VIEW

Str. 30 = 3.18 Cu. Yd.
Str. 5A = 178.7

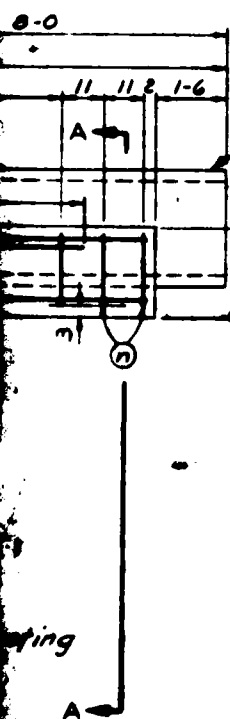


PLAN

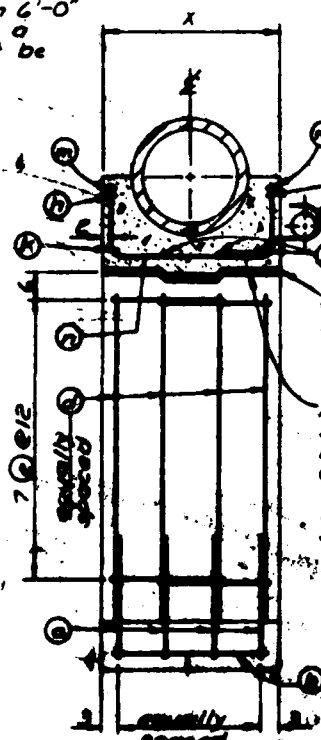


FRONT ELEVATION

DETAILS OF CRADLE SEAT ON TOP OF PIER



Outlet end section of conduit should be more than 6'-0" in length so a yoke will not be required.

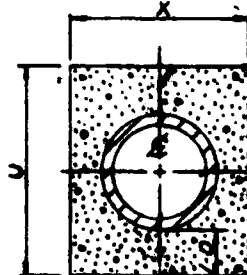


SECTION A-A

1/2" Metal Bar Drain Support, For details see sheet 20.

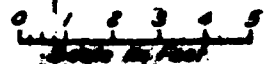
Cradle Seat on Top of Pier, See Detail

Pipe Cradle to be separated from pier by 1 layer of heavy asphalt treated roofing felt. Approximate weight 35 lbs./100 sq. ft.



SECTION B-B

Note: Details show steel for 24" diam. pipe. For 18" diam. pipe see Steel Schedule.

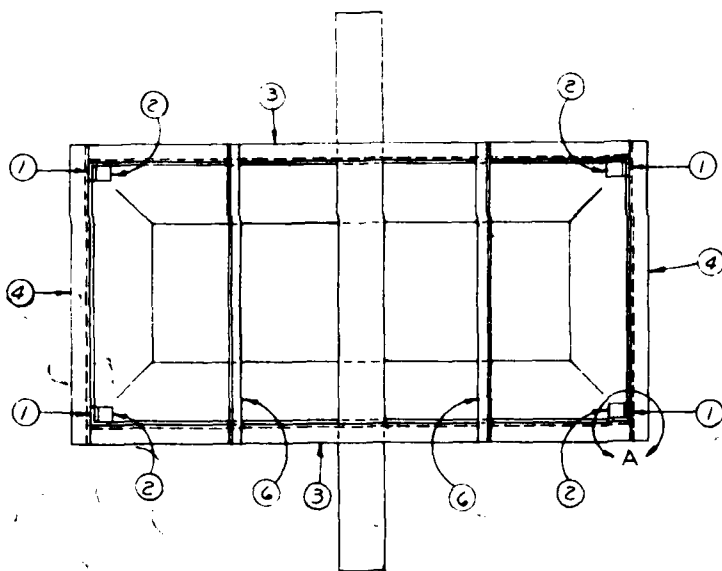


STANDARD DETAILS FOR CASTLEWOOD
REINFORCED CONCRETE PIPE OUTLET
FOR 18" & 24" PIPE DIAMETERS

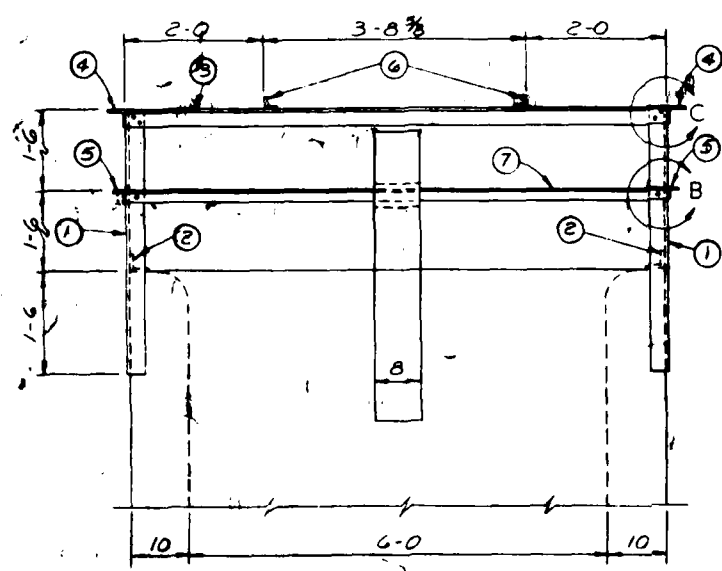
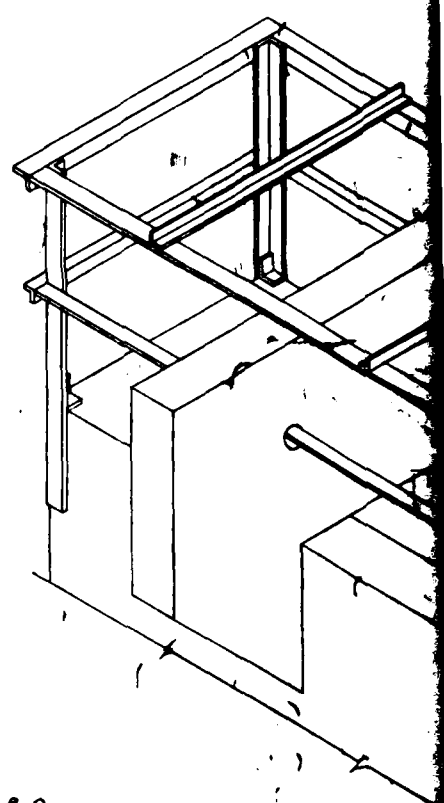
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

7.5 Mouth 4' x 4' x 4'

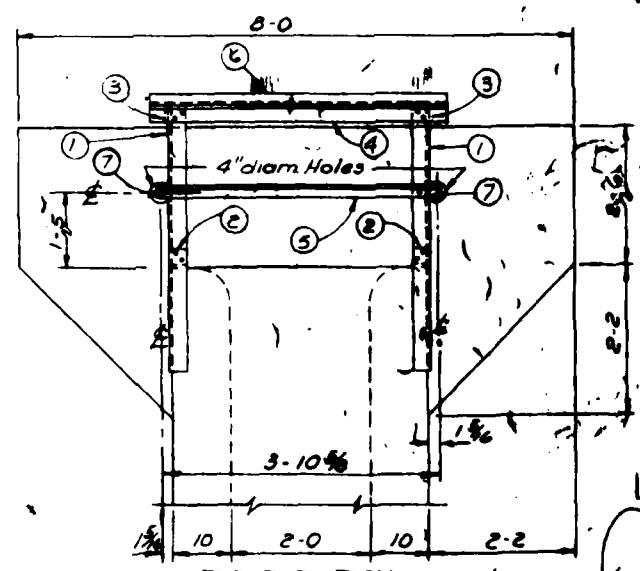
7.5 Surge 4' x 4' x 4'



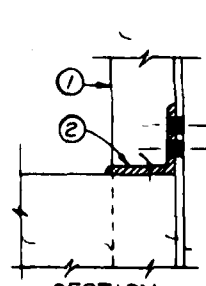
PLAN



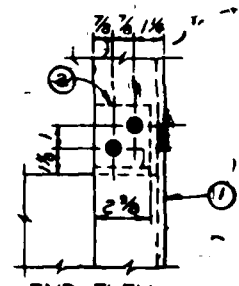
SIDE ELEVATION



END ELEVATION



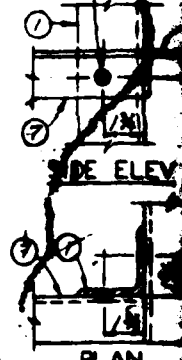
SECTION



END ELEV.

Note: Angles ① to be supported by clip angles ②. Clip angles to rest on top of structure.

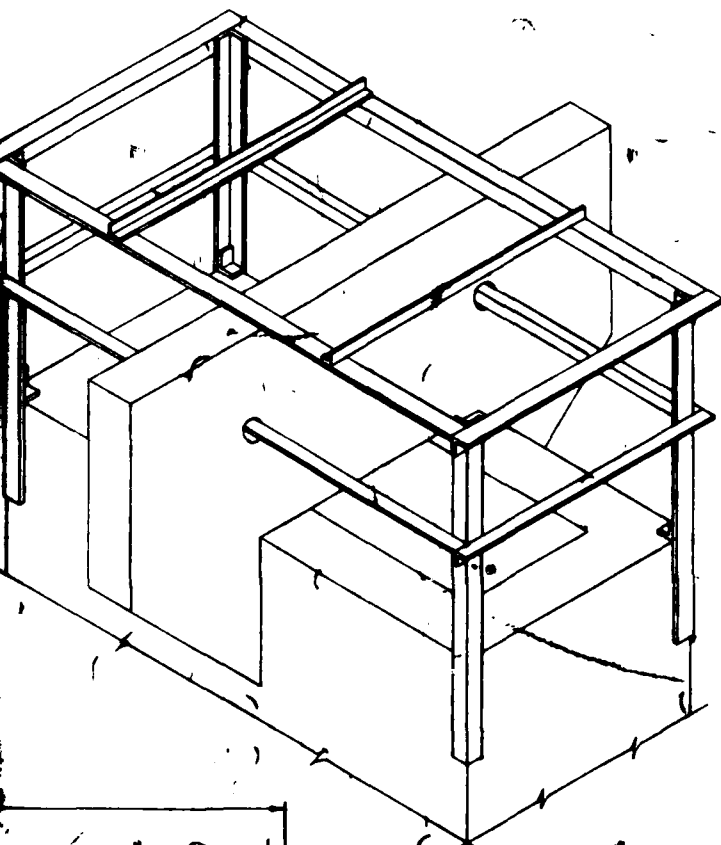
VIEW-A



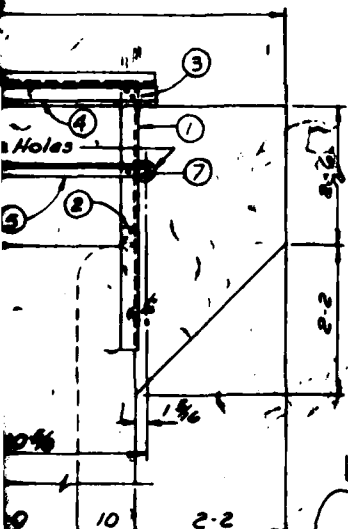
PLAN VIEW-B

Scale in Feet

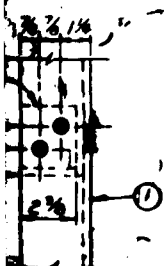
Scale in Feet



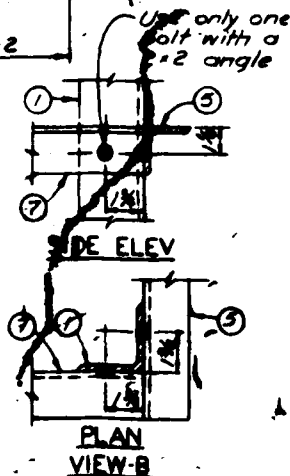
ISOMETRIC VIEW
Not to Scale



ELEVATION

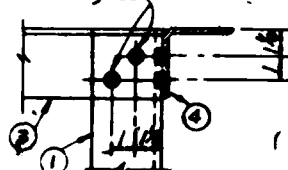


SIDE ELEV

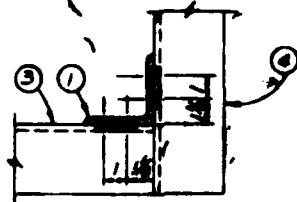


PLAN VIEW-B

Two bolts shall be used when connecting two 3x3 angles



SIDE ELEV



PLAN VIEW-C

Scale in Feet

Revised 5-25-61 J.A.S.

Scale in Feet Unless Shown

BILL OF MATERIAL

Mark	Quan.	Item	Length
1	4	3x3x1/4 (2 Left and 2 Right)	4-6
2	4	" " " "	0-2 1/2
3	2	" " " "	7-8 1/2
4	2	" " " "	4-2 1/2
5	2	2x2x1/4	4-0 1/2
6	2	" " " "	4-2 1/2
7	2	" " " "	7-8 1/2
3/8 1/2" Aluminum Bolts with Lock Washer			0-1 1/4

Notes:

Trash Rack and Guard Rail to be fabricated of aluminum angles bolted together with 1/2" bolts.

All aluminum surfaces in contact with concrete or other dissimilar material shall be cleaned and given a heavy coat of alkali-resistant bituminous paint and allowed to dry before assembly.

Gaskets of compressed paper or asphaltic joint filler may be used in lieu of painting.

All contacting surfaces of aluminum to aluminum shall be cleaned and coated with Zinc Chromate primer and allowed to dry before assembly.

All cuts shall be saw cuts.

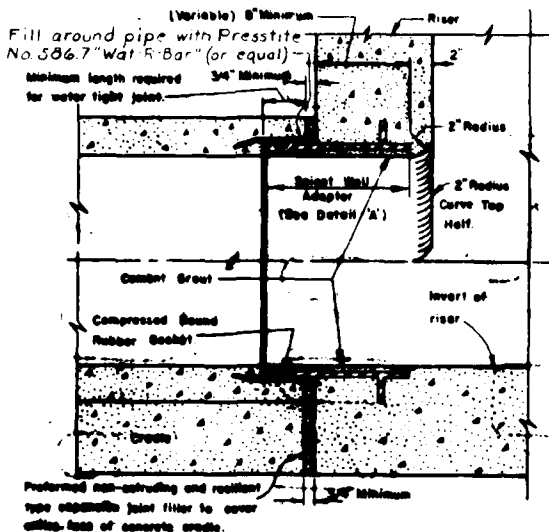
All holes for bolts shall be 1/8" larger than bolt diameter.

STRUCTURES 13-5-A & 5-B

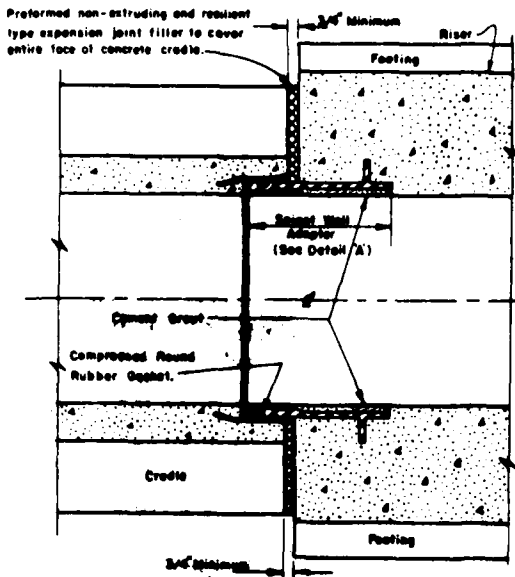
DETAILS OF TRASH RACK AND/OR GUARD RAIL FOR INLET SIZE 2-0x6-0
Platte River Tributaries Watershed,
PL 566, North Columbia S.C.B. Missouri

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

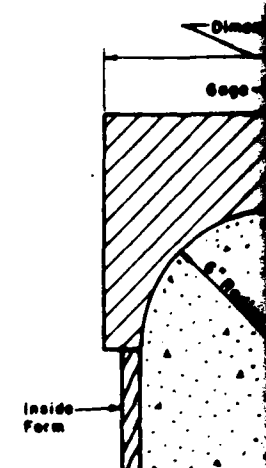
by D. J. Neubauer 8-60	checked by J. A. S. 9-60
by R. L. Neubauer 2-61	checked by J. A. S. 3-E-46041-P



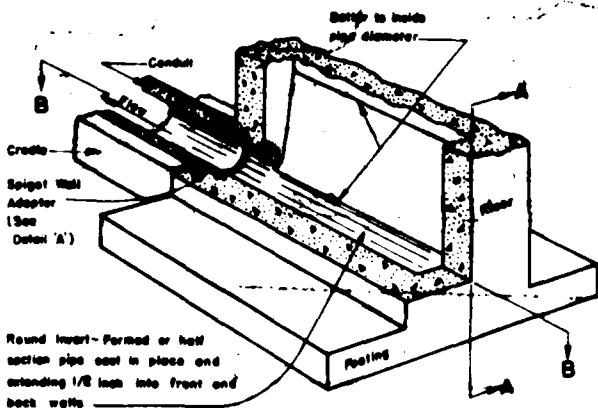
SECTION A-A ON CENTERLINE



SECTION B-B



Material—Wood or Sheet Steel—1/4" thick. Use gage. Except for bottom gage, the option of builder. Under no circumstances, etc. be so located as to shape of curved wall section of entire length.



PERSPECTIVE VIEW

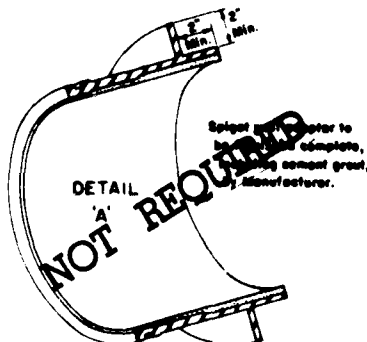
SPIGOT WALL ADAPTER

STEEL RING

REV. 8-12-00

To permit a good concrete bond, steel and grout surfaces shall be thoroughly cleaned. Spigot Wall Adapter (steel ring with gasket) to be supplied by Manufacturer for size shown in table. Note: Spigot Wall Adapter and material to be included with unit price for pipe conduit.

Size	Weight	Per Lin.	Adapter Length
3-B	32.185	24	15 3/8"
5-A	31.000	24	13 3/8"
5-B	14.45	18	13 3/8"

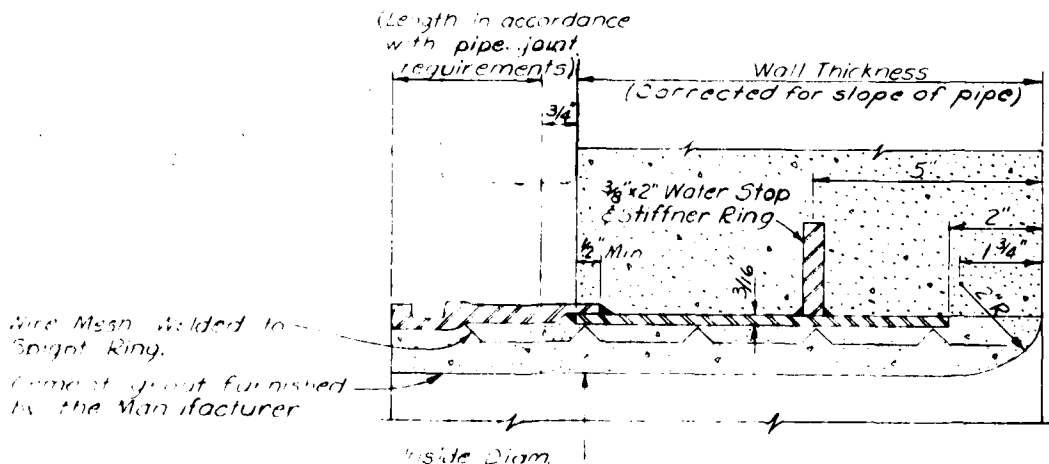


DETAIL

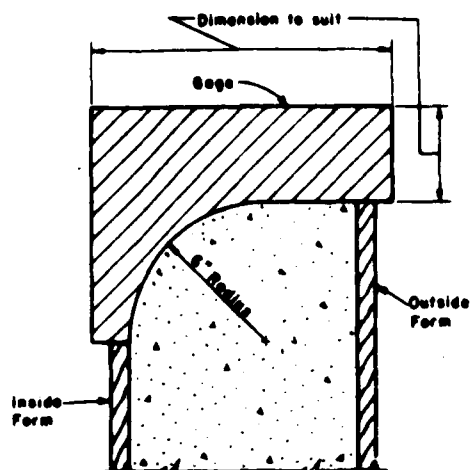
NOT REQUIRED

ALTERNATE:
At the Contractor's own risk, the gage may be formed with a shaping tool in lieu of the gage.

GRADATION TABLE FOR FILTER MATERIAL	
Sieve No.	Percentage Passing
2"	100
1 1/2"	100
1"	100
3/4"	100
1/2"	100
3/8"	100
4"	100
8"	100
16"	100
30"	100
50"	100
100"	100
200"	100



SECTION SPIGOT WALL ADAPTER (DETAIL 'A')



Material—Wood or Sheet Steel—1 Req'd. Builder to provide and use gage. Except for bottom gaging edge, shape of gage is at the option of builder. Under no circumstances should forms, braces, walers, etc. be so located as to interfere with the accurate shaping of curved weir section of corners and throughout its entire length.

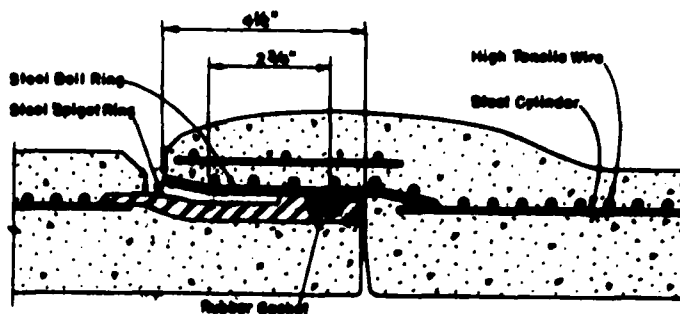
WEIR RADIUS GAGE

Rev. 1-21-50

ALTERNATE:

At the Contractor's own option the weir edge may be formed with a minimum 3/4" radius edging tool in lieu of the above WEIR RADIUS GAGE.

GRADATION TABLE FOR FILTER MATERIAL	
Sieve No.	% Passing
2"	100
1 1/2"	95-100
1"	87-100
3/4"	81-100
3/8"	73-94
1/2"	68-89
4	54-76
8	41-65
16	29-54
30	18-42
50	5-30
100	0-18
200	< 5



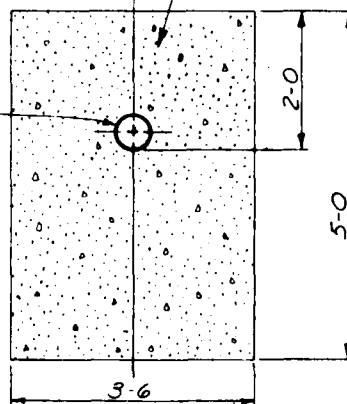
Special steel bell and spigot joint 4 1/2" long, as manufactured by the "Lock Joint Pipe Company" and shown on their drawing No. D-2-248-30, or equivalent.

(SCHEMATIC ONLY) DETAIL OF SPECIAL PIPE JOINT

Special Joints are required for
Structure Nos. 3-B, 5-A and 5-B.

Porous filter continuous along
perforated pipe drain consisting
of graded sand and gravel
mixture.

6" diam. Perforated
Helical Corrugated
Metal Pipe Drain



CROSS SECTION OF POROUS FILTER FOR 6" PERFORATED HELICAL C.M. PIPE

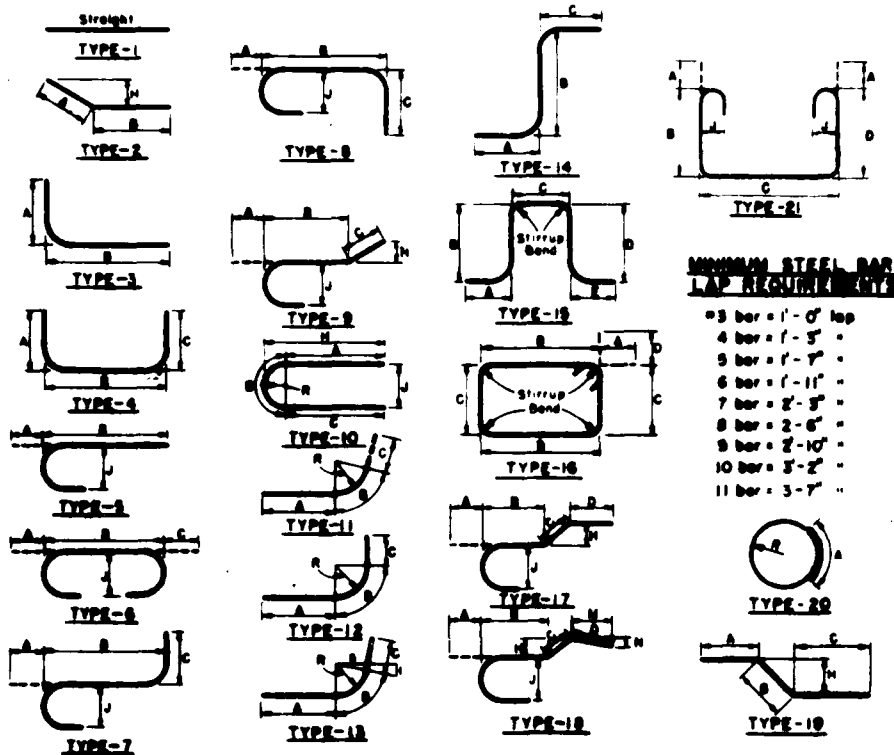
STANDARD DETAILS

Platte River Tributaries Watershed, PL 566
Worth County, S.C.D., Missouri

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Drawn	By	App'd
Traced	By	App'd
Checked	By	App'd
R.C. Heckman	5/6/55	3-E-46041-P

PLATE 09



MINIMUM STEEL BAR LAP REQUIREMENTS

- #3 bar = 1'-0" lap
- 4 bar = 1'-3" "
- 5 bar = 1'-7" "
- 6 bar = 1'-11" "
- 7 bar = 2'-3" "
- 8 bar = 2'-6" "
- 9 bar = 2'-10" "
- 10 bar = 3'-2" "
- 11 bar = 3'-7" "

Porous filter at
pipe drain con-
sand and gra-

6" diam. Perforated
Helical C.M. Pipe Drain

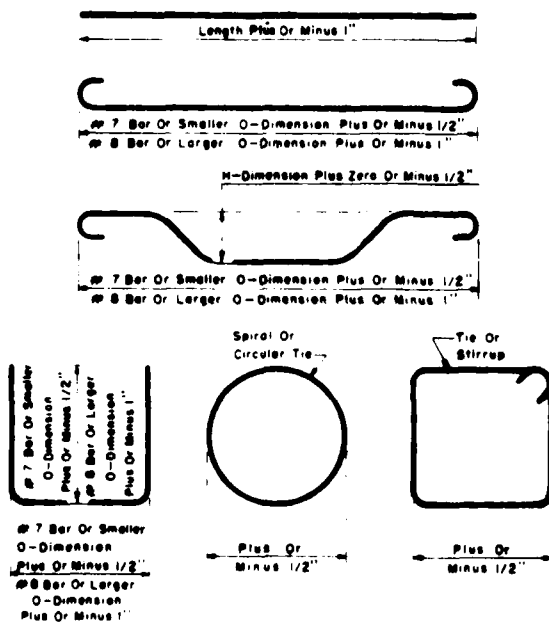
CROSS SECTION

6" PERFORATED

NOTE: All bars not otherwise specified shall conform to the proposed standard A.C.I. code, recommended sizes. All dimensions are measured from outside to outside of bar, except where otherwise specified. It shall be the responsibility of the fabricator to assign a code number to bars for each structure and parts thereof.

BAR TYPE DETAILS

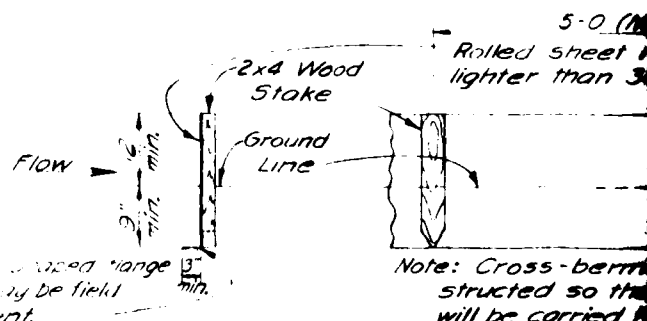
Revised 1-22-54



NOTE: Tolerances for outside to outside dimensions of bar types not shown shall conform to the tolerances of similar bar types and specified bar sizes as given in Manual of Standard Practice for Detailing Reinforced Concrete Structures A.C.I. 318

TYPICAL PERMISSIBLE TOLERANCES

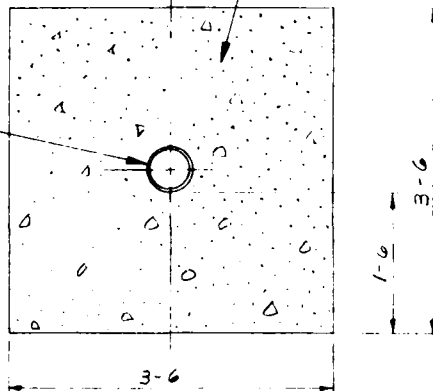
9-22-59



DETAILS OF WATERWAY CROSS

Porous filter continuous along perforated pipe drain consisting of Pit-Run sand and gravel mixture

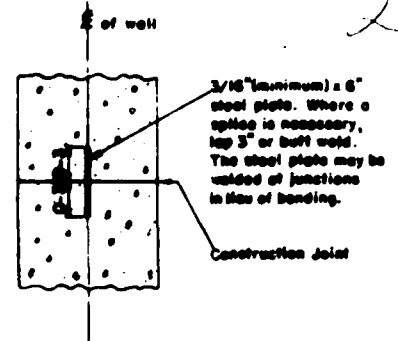
6" diam. Perforated Helical C.M. Pipe Drain



CROSS SECTION OF POROUS FILTER FOR
6" PERFORATED HELICAL C.M. PIPE

Note:
Metal plate shall be free from dirt, oil, grease, paint, mill scale, loose or thick rust, or other coating which might destroy or reduce its bond with concrete.

Metal plate and installation to be included with unit price for concrete.

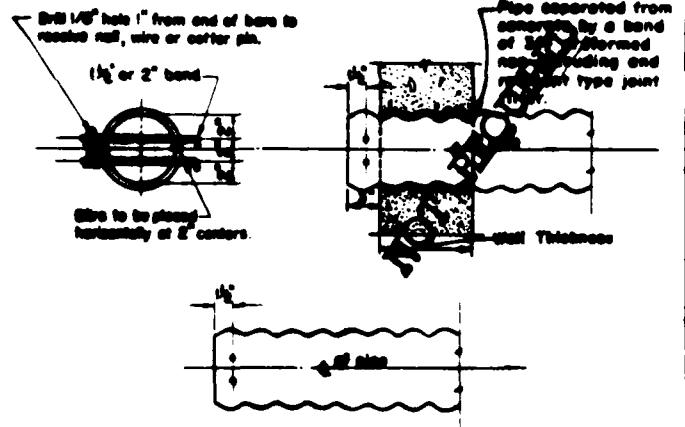


DETAIL OF METAL PLATE TYPE
CONSTRUCTION JOINT

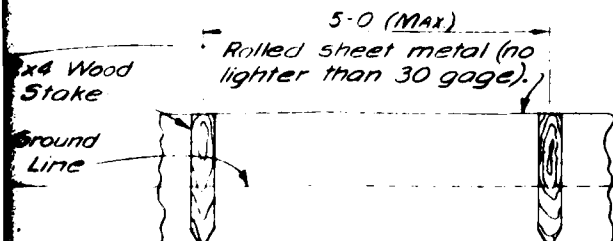
Rev. 9-2-59

BILL OF MATERIAL			
Pipe Diam.	Bar Size	Quantity	Length
6"	#3 or #4	2	1'-0"
8"	#3 or #4	3	1'-8"
10"	#3 or #4	4	1'-6"

All holes in pipe to receive bars shall be 1/8" dia.



DETAILS OF ANIMAL GUARD



Note: Cross-berms shall be constructed so that the drainage will be carried to the side channels.

DETAILS OF WATERWAY CROSS-BERM

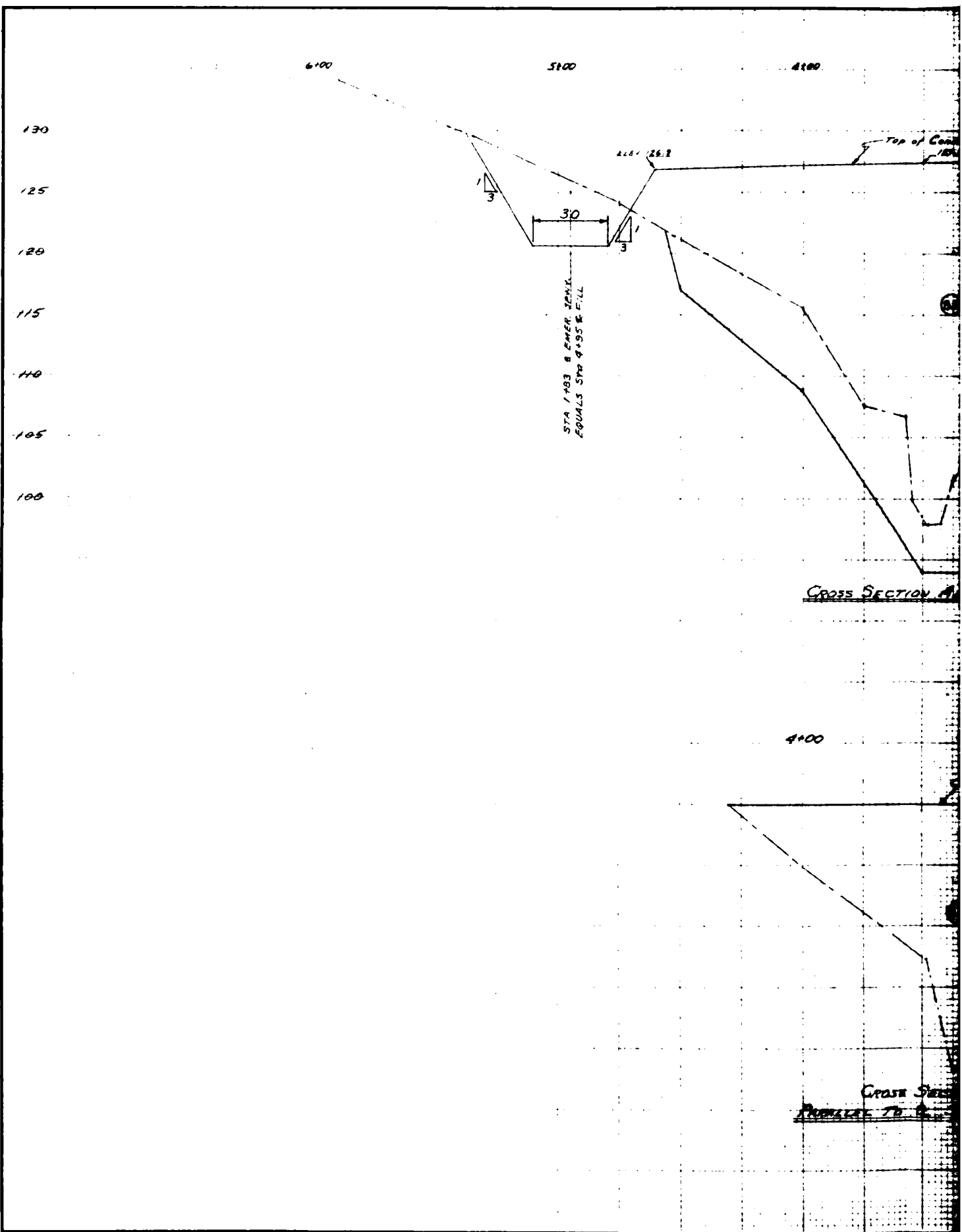
Notes
Cost of material, fabrication and installation of the Cross Berms to be included in the unit bid price for "Waterway Improvement" Tech. Spec.-171, Amend. No. 1 (Total approximate lengths-230 Lin. Ft.)

STANDARD DETAILS

Platte River Tributaries Watershed,
PL 566, Worth County S.C.D., Missouri

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Project	Sheet	Approved By	Date
Drawn			
Checked			
Reviewed			
R.C. Heckman, 5/6/60		3-E-46041-P	



4100

3100

2100

1400

Top of Constructed Fill
Elev. 127.5

RAILROAD
& HIGHWAY

Elev 126.7

(B3)

(EC)

(B3)

BOTTOM OF CORE TRENCH
6' 8" WIDE

CROSS SECTION ALONG E OF FILL

4100

3100

2100

TOP OF CONSTRUCTED BERM
ELEV. 120.0

(B3)

CROSS SECTION OF BERM

PARALLEL TO E-30' E OF E OF FILL

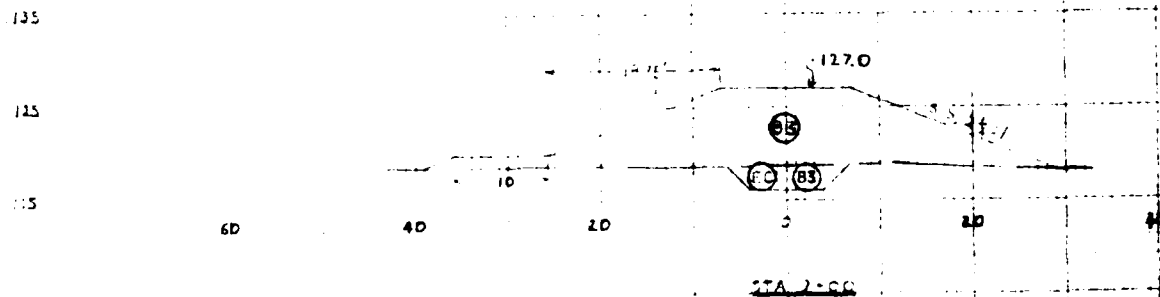
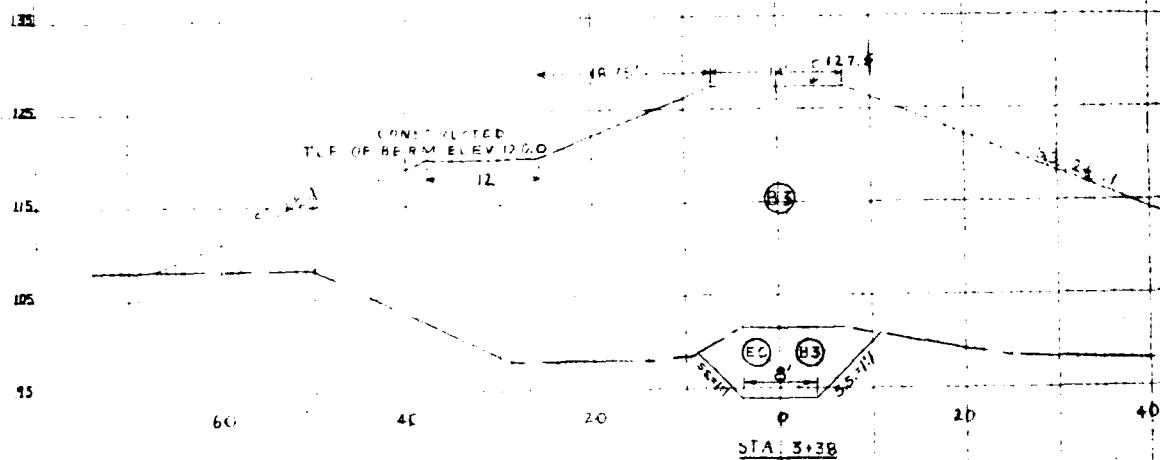
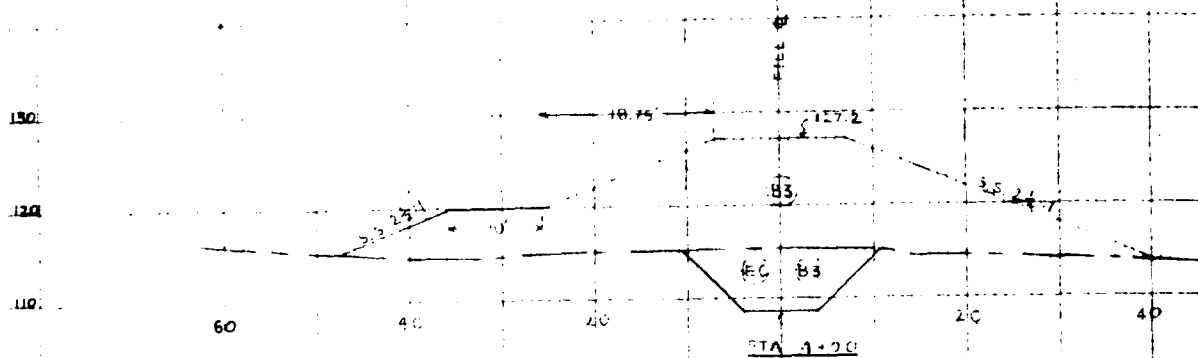
STRUCTURE 3-B

CROSS SECTIONS ALONG & PARALLEL TO E OF FILL
PLATTE RIVER TRIBUTARIES WATERSHED, PL-566
WORTH COUNTY SCD, MISSOURI

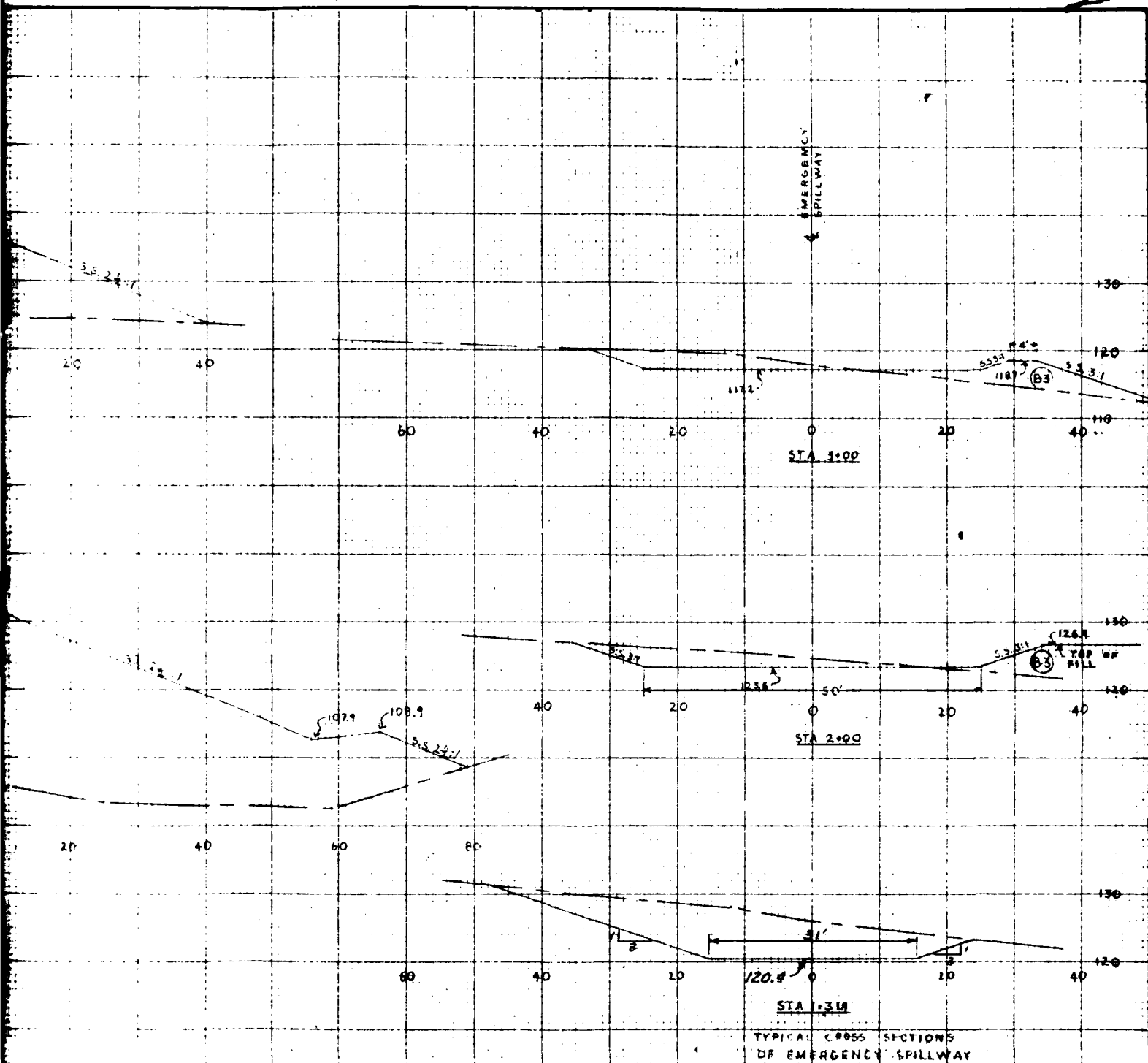
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date	Approved by
H. J. JAWHARA	2-61	File
Drawn		
O. KINDERLY	2-61	File
Traced		
Checked		
Townsend	2-61	File
Sheet		Drawing No.
3-E-46041-C		

PLATTE RIVER TRIBUTARIES WATERSHED, PL-566



TYPICAL CROSS SECTIONS
PERPENDICULAR TO FILL

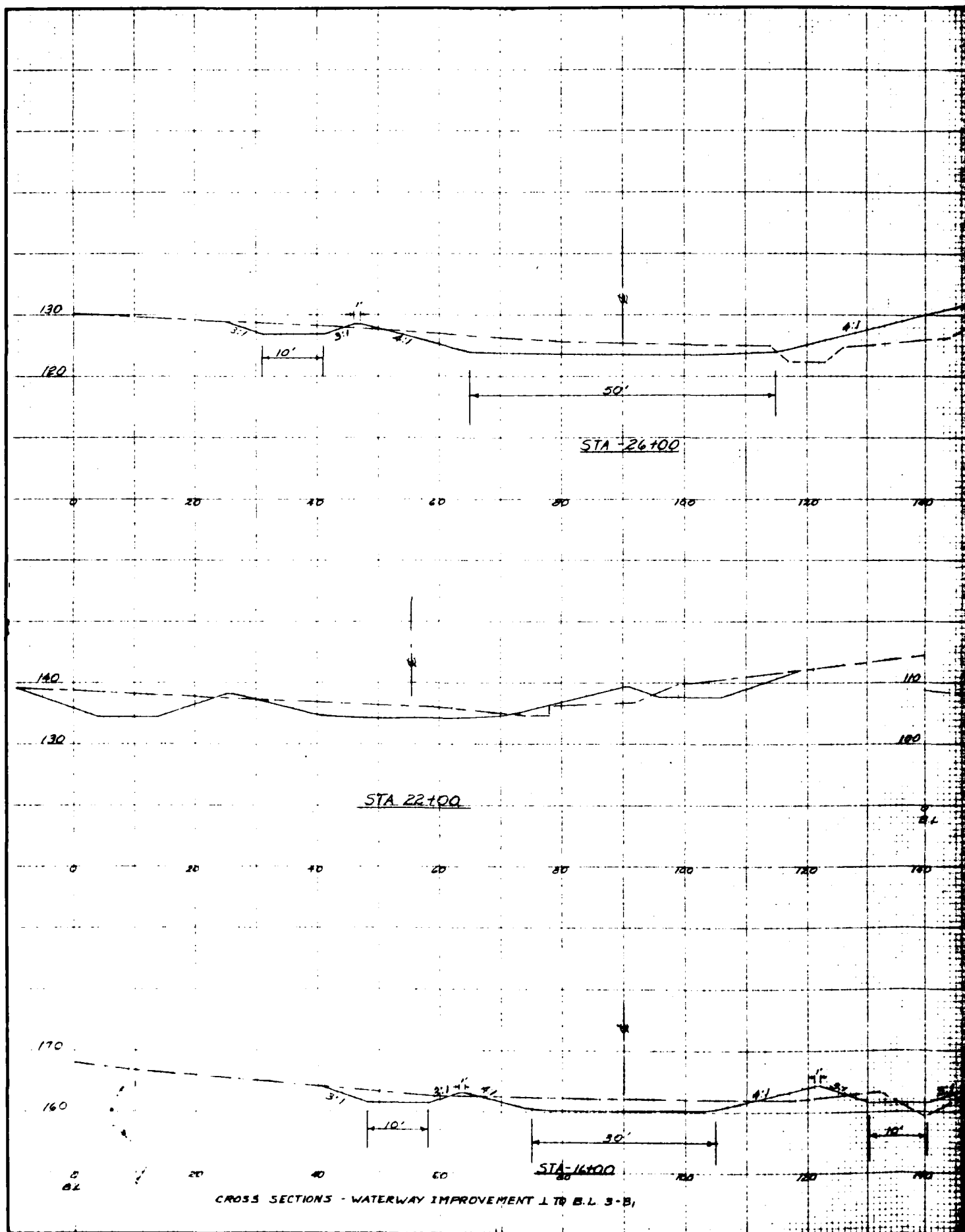


STRUCTURE 3-B
CROSS SECTIONS OF FILL & EMER. SPWAY
PLATTE RIVER TRIBUTARIES WATERSHED PL. 56C
WORTH COUNTY, MO., MISSOURI

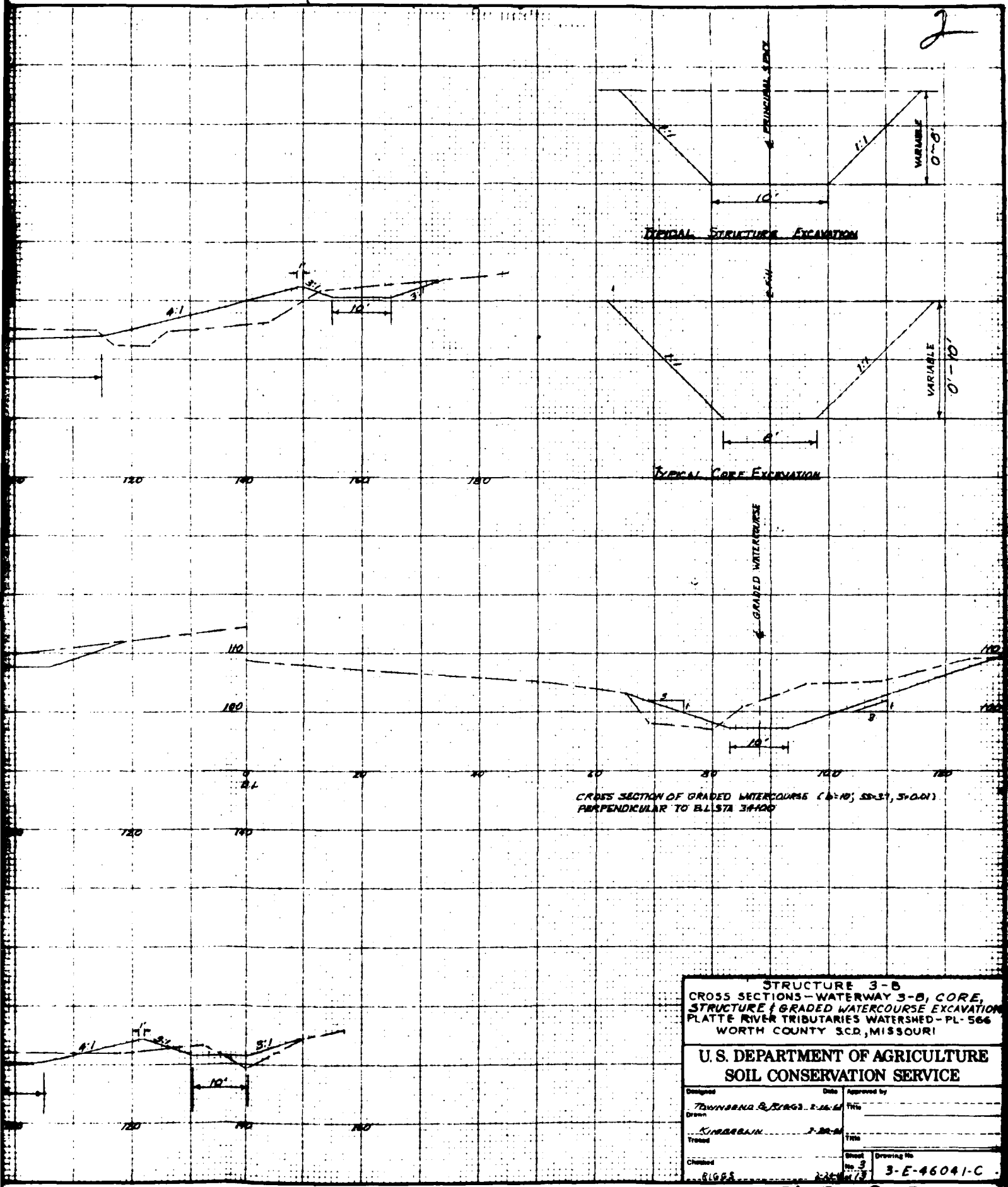
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed H. B. Townsend	Date 2-6-61	Approved by Title
Drawn V. N. BIGGS	Date 2-7-61	Title
Checked Townsend	Sheet No. 2-1461	Drawing No. 3-E-46041-C

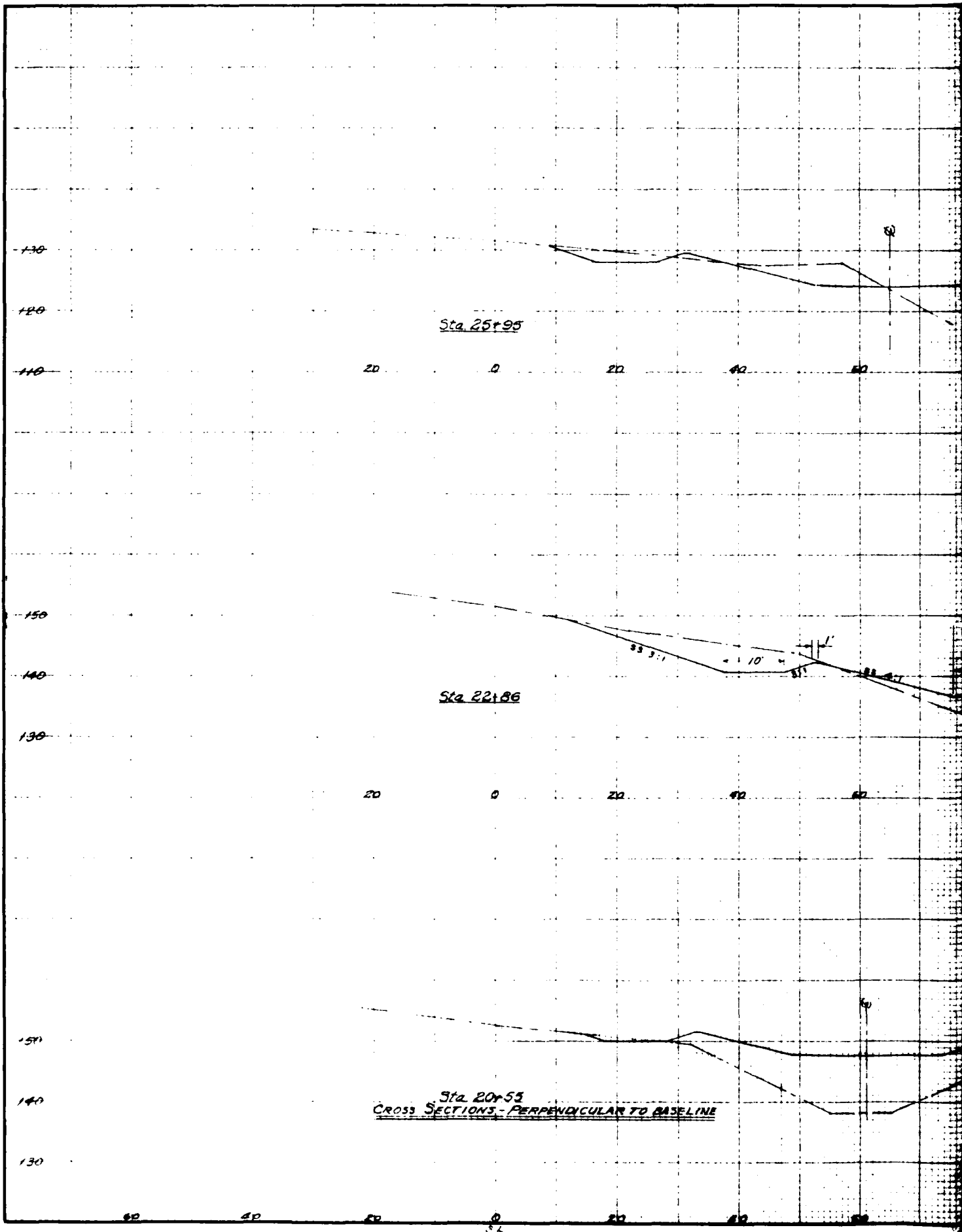
SECTIONS
OF FILL &



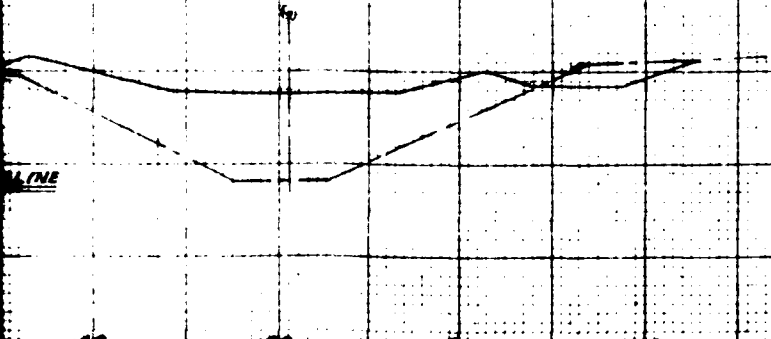
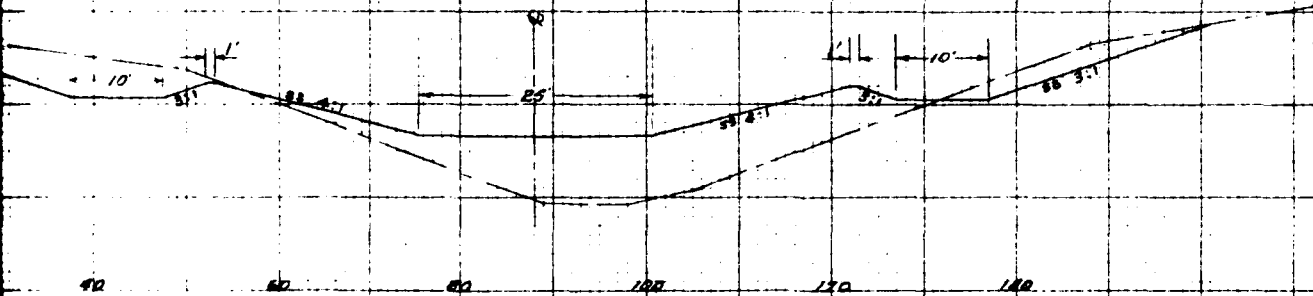
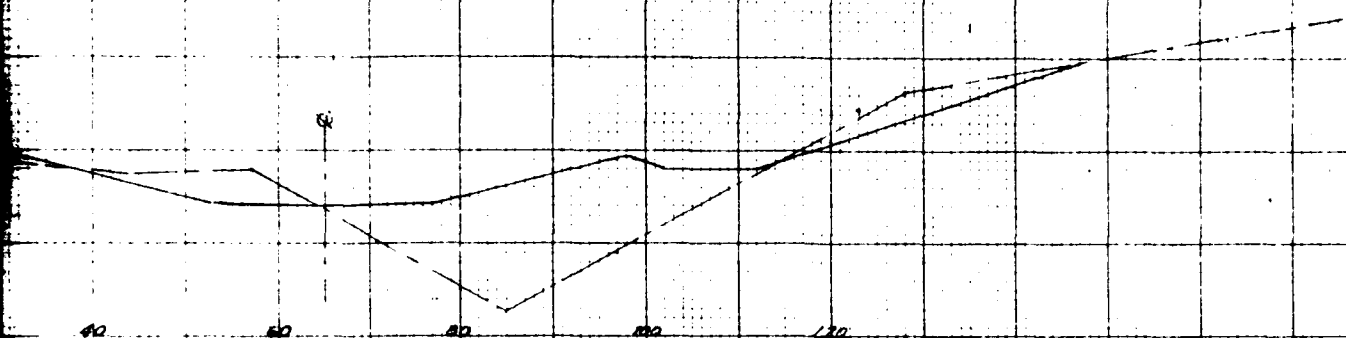
2



<p align="center">STRUCTURE 3-B CROSS SECTIONS - WATERWAY 3-B, CORE, STRUCTURE 1 GRADED WATERCOURSE EXCAVATION PLATTE RIVER TRIBUTARIES WATERSHED - PL-566 WORTH COUNTY SCD, MISSOURI</p>			
<p align="center">U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE</p>			
Designed	Date	Approved by	
Drawn		Title	
Checked		Time	
<p>Designed by: <u>THOMAS B. & RING, 2-16-61</u></p> <p>Drawn by: <u>KIRK BAIN</u></p> <p>Checked by: <u>GLGFS</u></p>		<p>Sheet No. <u>3</u></p> <p>Drawing No. <u>3-E-46041-C</u></p>	



2



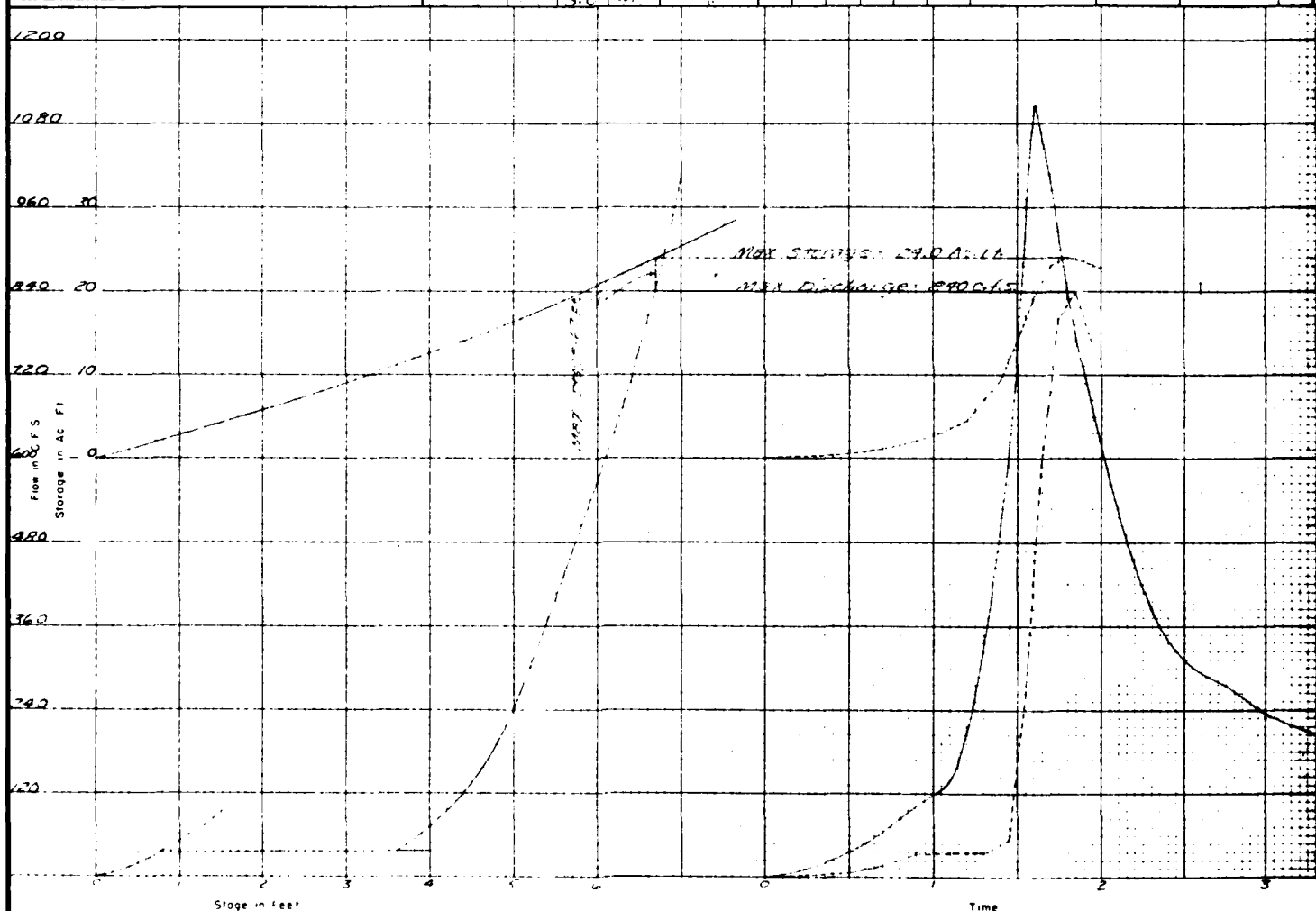
STRUCTURE 3-B			
CROSS SECTIONS - WATERWAY IMPROVEMENTS			
WATERWAY 3-B			
PLATTE RIVER TRIBUTARIES WATERSHED - PL-566			
WORTH COUNTY SCD, MISSOURI.			
U. S. DEPARTMENT OF AGRICULTURE			
SOIL CONSERVATION SERVICE			
Designed	Date	Approved by	
H.B. Townsend	2-17-61	TWS	
Drawn			
O. KIMBERLIN	2-18-61		
Traced			
Checked		Sheet	Drawing No.
H.B. Townsend	2-24-61	4	3-E-46041-C

PLATE 2-11 November 1960

See Note on sheet 10 of 10

SUMMARY DATA			STRUCTURE 3-B		
Top of Embankment	Elev	149.7	PLATTE RIVER TRIBUTARIES WATERSHED PL. 566 WORTH COUNTY, MO. MISSOURI FLOOD ROUTING EMERGENCY SPILLWAY U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		
Emergency Spillway	Elev	150.0			
High Stage Inlet	Elev	150.0			
Low Stage Inlet	Elev	149.8			
Inlet Inlet End of Conduit	Elev	149.0			
Inlet Outlet End of Conduit	Elev	150.0	<div style="display: flex; justify-content: space-between;"> <div> <p>Design Rate or Runoff (cfs)</p> <p>Peak Rate of Inlet (cfs)</p> <p>Maximum Discharge (cfs)</p> <p>Free Maximum Stage (ft)</p> <p>Maximum Storage (ac ft)</p> <p>Available Sediment Storage Below Elev. 150.0</p> <p>Conduit Size</p> <p>Riser Size</p> <p>Drifts</p> </div> <div> <p>Perin</p> <p>Emer</p> <p>Freeboard</p> <p>150.6</p> <p>150.6</p> <p>150.6</p> <p>150.6</p> <p>150.6</p> <p>150.6</p> <p>150.6</p> <p>150.6</p> </div> </div>		
Maximum Tailwater	Elev	150.6			
Degree of Hazard		Medium			
Design Rate or Runoff (cfs)		150.6			
Peak Rate of Inlet (cfs)		150.6			
Maximum Discharge (cfs)		150.6	<div style="display: flex; justify-content: space-between;"> <div> <p>Design Date: 10/1/64</p> <p>Drawn By: J. J. J. J. J.</p> <p>Traced: J. J. J. J. J.</p> <p>Checked: J. J. J. J. J.</p> </div> <div> <p>Approved by: J. J. J. J. J.</p> <p>Title: J. J. J. J. J.</p> <p>Sheet No. 2 of 10</p> <p>Drawing No. 3-E-46041-H</p> </div> </div>		
Free Maximum Stage (ft)		150.6			
Maximum Storage (ac ft)		150.6			
Available Sediment Storage Below Elev. 150.0		150.6			
Conduit Size		150.6			

WATERSHED DATA			AVAILABLE SEDIMENT STORAGE					PRINCIPAL SPILLWAY											
Drainage Area: A			ELEV.	Stage	Area Flooded	Interval Storage	Cumulative Storage	WEIR		ORIFICE		CONDUIT						#	
Uncontrolled	Acres	Sq. M.						Low Stage		Low Stage		$Q = \frac{2g}{10 + K_1 + K_2 + K_3 + K_4} H^{3/2}$							
Controlled	Acres	Sq. M.						Size		Size		Type of Conduit	Length of Conduit	Size	n	K	K L		Size
Total A	Acres	Sq. M.						Q, Cfs		Q, Cfs		Q, Cfs	Q, Cfs	Q, Cfs	Q, Cfs	Q, Cfs	Q, Cfs		Q, Cfs
Degree of Hazard																			
Hydrologic Soil Group																			
Weighted Design Runoff Curve																			
Design Runoff Curve																			
Time of Concentration																			
Length of Watershed		Feet																	
Difference in Elevation		Feet																	
Tc		Hours																	
Average Velocity		ft per sec																	
Estimated SEDIMENT STORAGE Required - Ac Ft																			
Above Principal Spillway																			
Below Principal Spillway																			
Total																			
Notes:																			

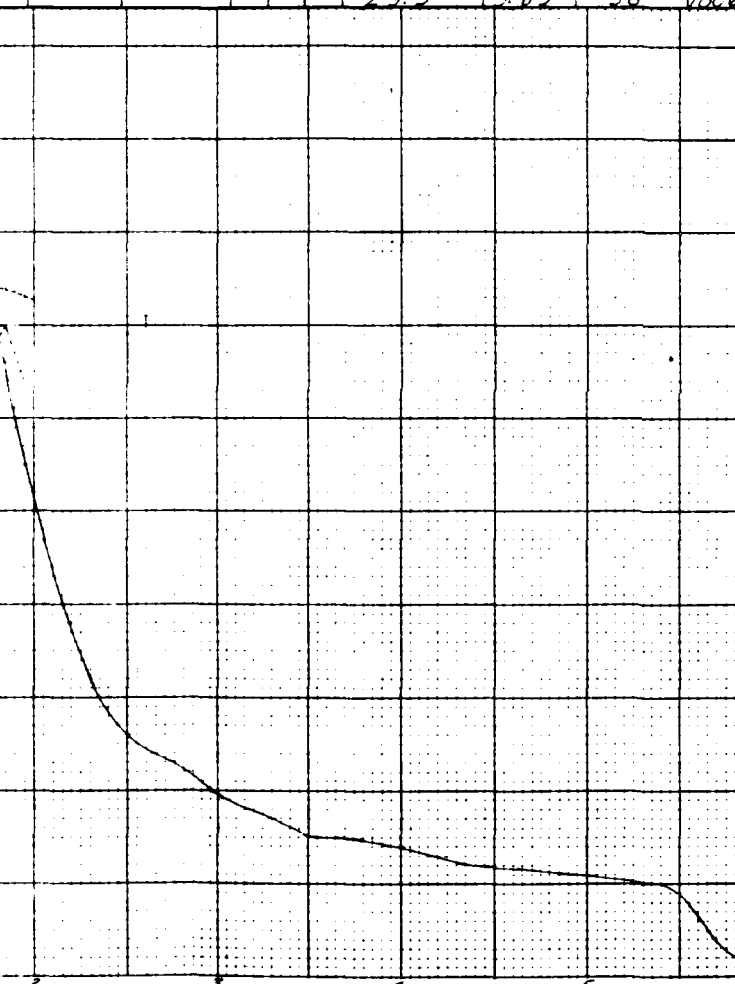


HYDROGRAPH DATA										Hydrograph Coordinates										
Dr. Area	sq. mi.	To	hrs.	Runoff Condition No.	Line No.	Time	hrs.	Q	cfs	Controlled Inflow	Total	Accum. Runoff	Line No.	Time	hrs.	Q	cfs	Controlled Inflow	Total	Accum. Runoff
Runoff Curve No.		Storm Distribution Curve		Storm Duration																
Rainfall Point	in	Area	in	Hydrograph Family No.																
Q	in	Computed To	0.7 To	hrs.	To	hrs.														
Computed To		To	Used		Revised To	hrs.														
ap	484A	(484)		cfs	Qap			cfs												
Rev To																				
		accumulated To	Rev To		accumulated (Q/ap)	Qap														
Hydrograph Coordinates on page 22																				

PRINCIPAL SPILLWAY DISCHARGE

CONDUIT						WEIR			CONDUIT						TOTAL DISCH			
$Q = \left(\frac{2.48}{10 + K_1 + K_2 + K_3 + K_4} \right)^{1/2} H^{3/2}$						at Elev. 120.0			$Q = \left(\frac{2.48}{10 + K_1 + K_2 + K_3 + K_4} \right)^{1/2} H^{3/2}$									
Type of	Length of	Size	n	K	K L	Size	Length of	Size	n	K	K L	Type of	Length of	Size		n	K	K L
$-K_0 = -K = -K L$									$-K_0 = -K = -K L$									
$\frac{64}{0 + } H^{3/2}$									$\frac{64}{10 + 25 + 15} H^{3/2}$									
H ^{3/2}						Q cfs			H ^{3/2}						Q cfs			
Q cfs						Q cfs			Q cfs						Q cfs			

h	Q cfs	h	Q cfs	h	Q cfs	h	Q cfs	h	Q cfs	h	Q cfs	h	Q cfs	h	Q cfs
0.5	0.350	1.0	1.000	1.5	1.837	2.0	2.828	2.5	3.95	3.0	5.14	3.5	6.38	4.0	7.67
4.5	9.95	5.0	11.35	5.5	12.80	6.0	14.30	6.5	15.85	7.0	17.45	7.5	19.10	8.0	20.80
8.5	24.2	9.0	26.0	9.5	27.8	10.0	29.6	10.5	31.4	11.0	33.2	11.5	35.0	12.0	36.8



Time	Discharge (cfs)	Accum. Runoff (inches)
0	0	0
0.5	17.6	0.17
1.0	16.2	0.34
1.5	14.8	0.51
2.0	13.4	0.68
2.5	12.1	0.85
3.0	10.9	1.02
3.5	9.7	1.19
4.0	8.5	1.36
4.5	7.3	1.53
5.0	6.1	1.70
5.5	4.9	1.87
6.0	3.7	2.04
6.5	2.5	2.21
7.0	1.3	2.38
7.5	0.1	2.55
8.0	0.0	2.72

EMERGENCY

Emergency Crest Elev. \pm	ft
Maximum Allowable Vc \pm	ft
Design Calculations with References	
Vem \pm	

Final Design Values				
Lt	H		a = 3	
n = 0.040		b = 50.0		H
ES-124 Sheet 6 of 7				
Hp (feet)	qc cfs	dc feet	W feet	Q (cfs)
0.4	0.7	0.25	50.75	36
0.9	1.9	0.48	51.44	28
1.4	3.9	0.77	52.31	24
2.4	7.7	1.43	54.24	16
3.4	11.6	2.09	56.27	12

Check Vc max	
Vc max	ft
Exit Channel Slope	ft/s
to min	
to max	

TIME CONVERSION FACTOR

T	of ordinate, ac ft	±	726
	of ordinate, cfs		
	Principal	Emergency	Freeboard
T	±	min	min 6.25

CHECK - INFLOW HYDROGRAPH

Area under inflow hydrograph equals
computed volume of Runoff

Total Vol of Runoff R = $3 \times T = 60 \text{ sec/min}$
43560 ft³ ac ft

CHECK - INFLOW HYDROGRAPH			
Area under inflow hydrograph equals computed Volume of Runoff			
Total Vol of Runoff \pm	ft ³		
a \pm	area under inflow hydrograph in sq in		
s \pm	of ordinate in cfs		
t \pm	of horizontal in min		
Principal	Emergency	Freeboard	
s (cfs)			
t (min)			
a (sq in)			
R (ac ft)			
R (ac ft)			
Error (ac ft)			
Error (%)			
Permissible Limit \pm 3%			

CHECK OF FLOOD ROUTING			
Area between corresponding inflow and Outflow Curves equals Maximum Spillway Storage			
Storage \pm	ft ³		
a \pm	area between curves in sq in		
s \pm	of ordinate in cfs		
t \pm	of horizontal in min		
Principal	Emergency	Freeboard	
s (cfs)			
t (min)			
a (sq in)			
Storage (ac ft)			
Storage (Max)			
from Curve (ft)			
Error (ac ft)			
Error (%)			
Permissible Limit \pm 3%			

HYDROGRAPH EXTENSION

Time	Principal	Emergency	Freeboard
Hours	cfs	cfs	cfs
0			
0.5			
1.0			
1.5			
2.0			
2.5			
3.0			
3.5			
4.0			
4.5			
5.0			
5.5			
6.0			
6.5			
7.0			
7.5			
8.0			

See Note on sheet 10 of 10

Graph Coordinates

Time	Discharge (cfs)	Accum. Runoff (inches)
0	0	0
0.5	17.6	0.17
1.0	16.2	0.34
1.5	14.8	0.51
2.0	13.4	0.68
2.5	12.1	0.85
3.0	10.9	1.02
3.5	9.7	1.19
4.0	8.5	1.36
4.5	7.3	1.53
5.0	6.1	1.70
5.5	4.9	1.87
6.0	3.7	2.04
6.5	2.5	2.21
7.0	1.3	2.38
7.5	0.1	2.55
8.0	0.0	2.72

SUMMARY DATA

Top of Embankment	Elev	126.7	ft
Emergency Spillway	Elev	123.6	ft
High Stage Inlet	Elev	124.0	ft
Low Stage Inlet	Elev	124.0	ft
Invert Inlet End of Conduit	Elev	124.0	ft
Invert Outlet End of Conduit	Elev	124.0	ft
Maximum Tailwater	Elev	124.0	ft
Degree of Hazard	Prin	Emer	Freeboard
Design Rate or Runoff (in)			
Peak Rate of Inflow (cfs)			
Maximum Discharge (cfs)			
Elev Maximum Stage (ft)			
Maximum Storage (ac ft)			
Available Sediment Storage			
Below Elev			
Conduit Size			
Riser Size			
Orifice			

STRUCTURE 3-B

PLATTE RIVER TRIBUTARIES WATERSHED PL 566
WORTH COUNTY SCD MISSOURI
FLOOD ROUTING FREEBOARD SPILLWAY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed by	Checked by	Date	Approved by
Drawn by	Checked by	Date	Approved by
Traced by	Checked by	Date	Approved by
Checked by	Checked by	Date	Approved by

PLATE C-12

STRUCTURE HYDRAULIC

LOCATION	WATERSHED	STRUCTURE	3-B	5-A	5-B
GULLY					
STATION			32+90	31+00	14+45
TYPE			DROP INLET	DROP INLET	DROP INLET
KIND (FULL FLOW OR DETENTION)			DET	DET	DET
WATERSHED AREA		ACRES	1.64	1.09	1.62
CONTROLLED		ACRES	1.64	1.09	1.62
UNCONTROLLED		ACRES	1.64	1.09	1.62
TOTAL		ACRES	1.64	1.09	1.62
DESIGN RATE OF INFLOW		CFS	44	37	237
FROM CONTROLLED AREA		CFS	44	37	237
FROM UNCONTROLLED AREA		CFS	44	37	237
TOTAL		CFS	44	37	237
PRINCIPAL SPILLWAY OUTFLOW		CFS	66	3	38
RATIO OF OUTFLOW TO INFLOW		Q ₀ /Q _i	0.34	0.07	0.078
EMERGENCY SPILLWAY OUTFLOW		CFS	66	3	38
MAXIMUM STAGE ABOVE CREST		FEET	2.3	3.7	3.2
ESTIMATED STORAGE DATA		AC FT	6.9	2.2	14.9
TEMPORARY WATER STORAGE ABOVE CREST		AC FT	6.9	2.2	14.9
TOTAL BELOW CREST		AC FT	6.9	2.2	14.9
REQUIRED WATER STORAGE BELOW CREST		AC FT	6.9	2.2	14.9
AVERAGE RATE OF SEDIMENT ACCUMULATION		ACFT/SQM/YR	0.24	0.24	0.59
REQUIRED SEDIMENT STORAGE		AC FT	4.4	5.1	7.4
SEDIMENT STORAGE BELOW CREST		AC FT	4.4	4.7	6.8
SEDIMENT STORAGE ABOVE CREST		AC FT	2.4	2.4	0.6
TOTAL SEDIMENT BASIN AVAILABLE		AC FT	20.0	24.0	48.8
LIFE OF AVAILABLE SEDIMENT BASIN		YEARS	624	238	326
SEDIMENT TRAP EFFICIENCY		PERCENT	90	90	90
PERMANENT POOL AREA		ACRES	2.7	4.0	6.2

CHANNEL HYDRAULIC

LOCATION	WATERSHED	STRUCTURE	3-B	5-A	5-B
GULLY					
STATION			33+79	24+35	14+22
TO STATION			34+85	24+35	27+50
TYPE OF IMPROVEMENT			WATERCOURSE	WATERCOURSE	WATERCOURSE
CONTROLLED		ACRES	1.2	2.71	1.62
UNCONTROLLED		ACRES	33	75	27
TOTAL		ACRES	1.2	33	75
DESIGN FLOW		CFS	66	61	49
MAXIMUM ALLOWABLE (DESIGN)		FT/SEC	4.0	4.0	4.0
CONTROLLED FLOW		FT/SEC	3.9	4.1	4.1
CONTROLLED & UNCONTROLLED FLOW		FT/SEC	3.9	4.1	4.1
DEPTH OF FLOW		FEET	1.3	1.1	0.7
CONTROLLED & UNCONTROLLED (TRAPEZOIDAL)		FEET	1.3	1.1	0.7
CONTROLLED & UNCONTROLLED (PARABOLIC)		FEET	1.3	1.1	0.7
"N" VALUE (MANNINGS) OR RETARDANCE (CFS/TF)			0.04	0.04	0.04
BOTTOM WIDTH (TRAPEZOIDAL)		FEET	10	10	10
SIDE SLOPES (HORIZONTAL/VERTICAL)		RATIO	3:1	3:1	3:1
TOP WIDTH (PARABOLIC)		FEET	3.1	3.1	3.1
SLOPE OF CHANNEL		FT/FT	0.01	0.015	0.015

NOTE: CONTROLLED AREA AND FLOW REFERS TO THE AREA ABOVE AND THE DISCHARGE FROM A FLOOD DETENTION TYPE OF STRUCTURE.

THIS SPACE FOR PERTINENT DATA AND COMPUTATIONS NOT OTHERWISE SHOWN

* 1. Principal Spillway Hydrograph

2. Emergency Hydrograph

3. Freeboard Hydrograph

Note: In accordance with Engineering Memorandum S.C.S. 42(Rev. 2) dated February 20, 1964, the conduit size for structure 3-B has been changed from 18" dia. to 24" dia.

The emergency and freeboard hydrograph summary values shown above for structure 3-B have not been revised. They are conservative for the new conduit size.

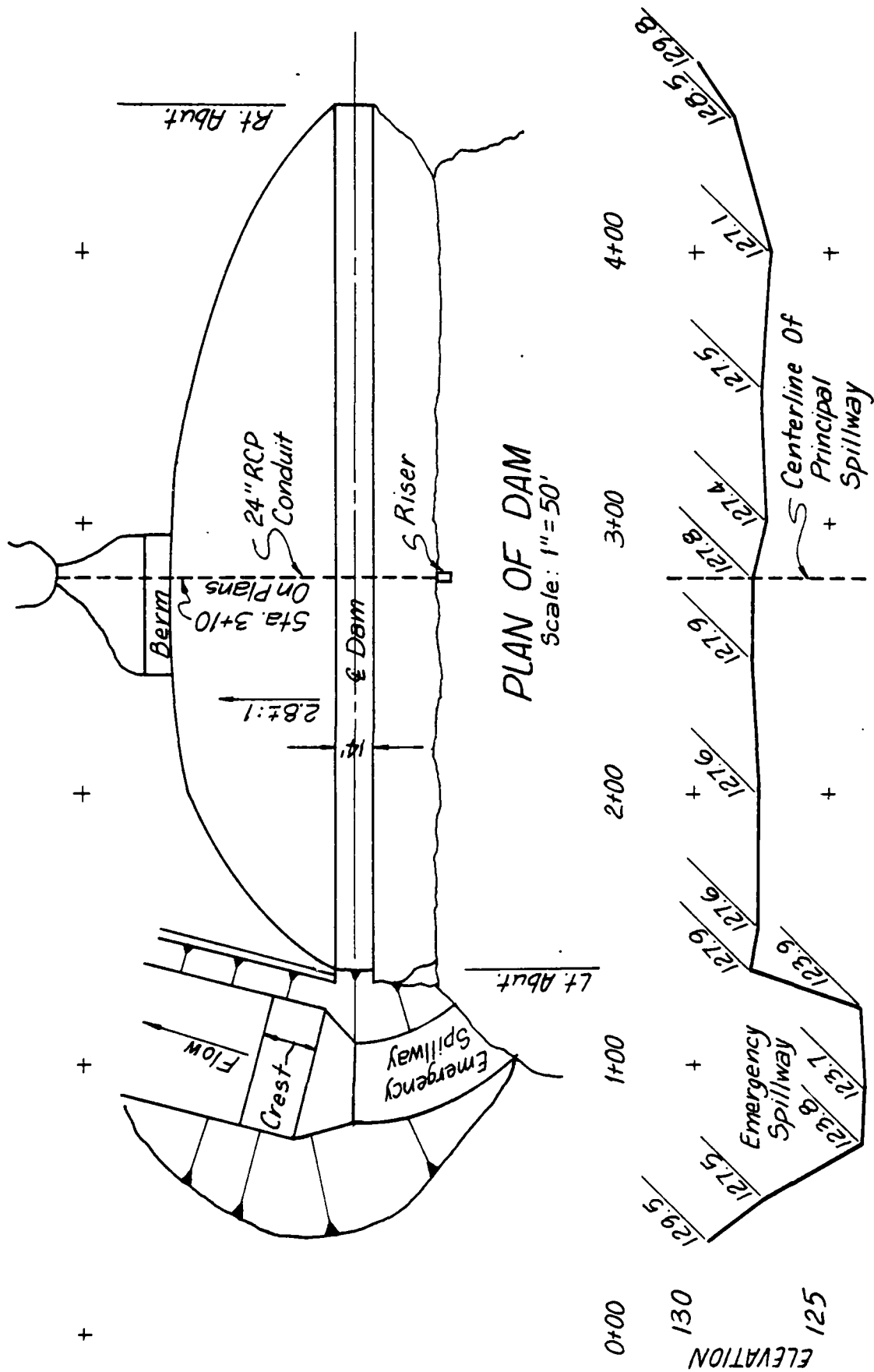
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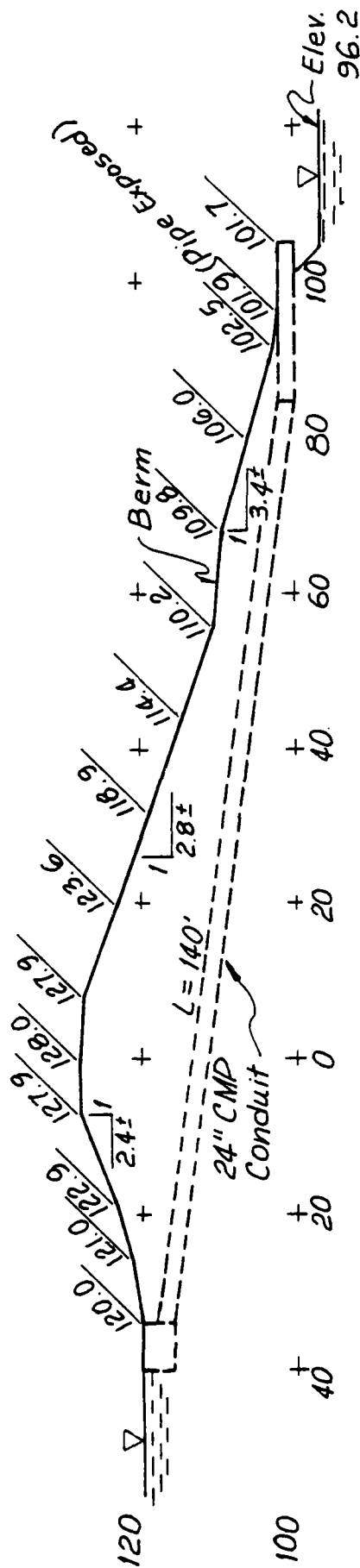
Quercus Givens T.G. & C.

Material used or Sub-allocated

[illegible]

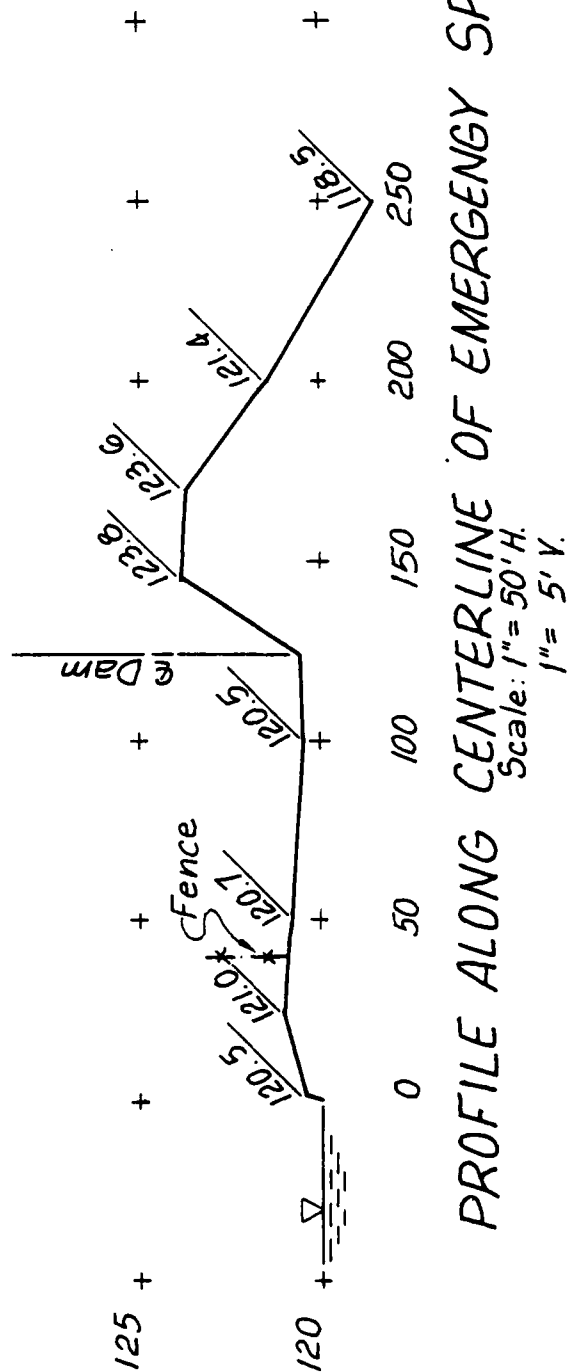
APPENDIX D
HYDRAULIC AND HYDROLOGIC DATA





MAXIMUM CROSS-SECTION OF DAM AT STA. 2+80

Scale: 1" = 20'



PROFILE ALONG CENTERLINE OF EMERGENCY SPILLWAY

Scale: 1" = 50' H.

1" = 5' V.

APPENDIX D
HYDRAULIC AND HYDROLOGIC DATA

HYDROLOGIC COMPUTATIONS

1. The SCS dimensionless unit hydrograph and the systemized computer program HEC-1 (Dam Safety Version), July 1978, prepared by the Hydrologic Engineering Center, U.S. Corps of Engineers, Davis, California, were used to develop the inflow hydrographs (See this Section).
 - a. Twenty-four hour, one percent probabilistic rainfall for the dam location was taken from the data for the rainfall station at Maryville, MO. as supplied by the St. Louis District, Corps of Engineers per their letter dated 4 March 1980. The twenty-four hour probable maximum precipitation was taken from the curves of Hydrometeorological Report No. 33 and current Corps of Engineers and St. Louis policy and guidance for hydraulics and hydrology. Precipitation was distributed according to EM 1110-2-1411 (Section 4a).
 - b. Drainage area = 0.175 square miles (112 acres).
 - c. Time of concentration of runoff = 13.5 minutes (taken from the SCS plans).
 - d. The antecedent storm conditions for the probable maximum precipitation were heavy rainfall and low temperatures which occurred on the previous 5 days (SCS AMC III). The antecedent storm conditions for the one percent probabilistic precipitation were an average of the conditions which have preceded the occurrence of the maximum annual flood on numerous watersheds (SCS AMC II). The initial pool elevation was assumed at the invert of the principal spillway.
 - e. The total twenty-four hour storm duration losses for the one percent probabilistic storm were 2.87 inches. The total losses for the PMF storm were 1.58 inches. These data are based on SCS runoff curve No. 75 and No. 88 for antecedent moisture conditions SCS AMC II and AMC III respectively. The watershed is composed of primarily SCS soil groups B and D (Sharpsburg, Adair, and Lagonda silty clay loam respectively) and consist of approximately 50% row crops on contour and 50% small grain.
 - f. Average soil loss rates = 0.05 inch per hour approximately (For PMF storm, AMC III).
2. The combined discharge rating consisted of three components: the flow through the principal spillway, the flow through the emergency spillway and the flow going over the top of the dam.
 - a. The principal spillway rating was developed by the SCS by using the weir and full conduit flow equations.

- (1) Weir Flow equation ($Q=CLH^{1.5}$)
where C = weir coefficient = 3.4 (from SCS Engr. Memo 50)
L = effective weir length, ft. = 15.0
H = total head, ft.

- (2) Full conduit flow equation

$$Q = a \sqrt{\frac{2gH}{1 + K_r + K_p L}}$$

where a = cross-sectional area of pipe, $\text{ft}^2 = 3.14$

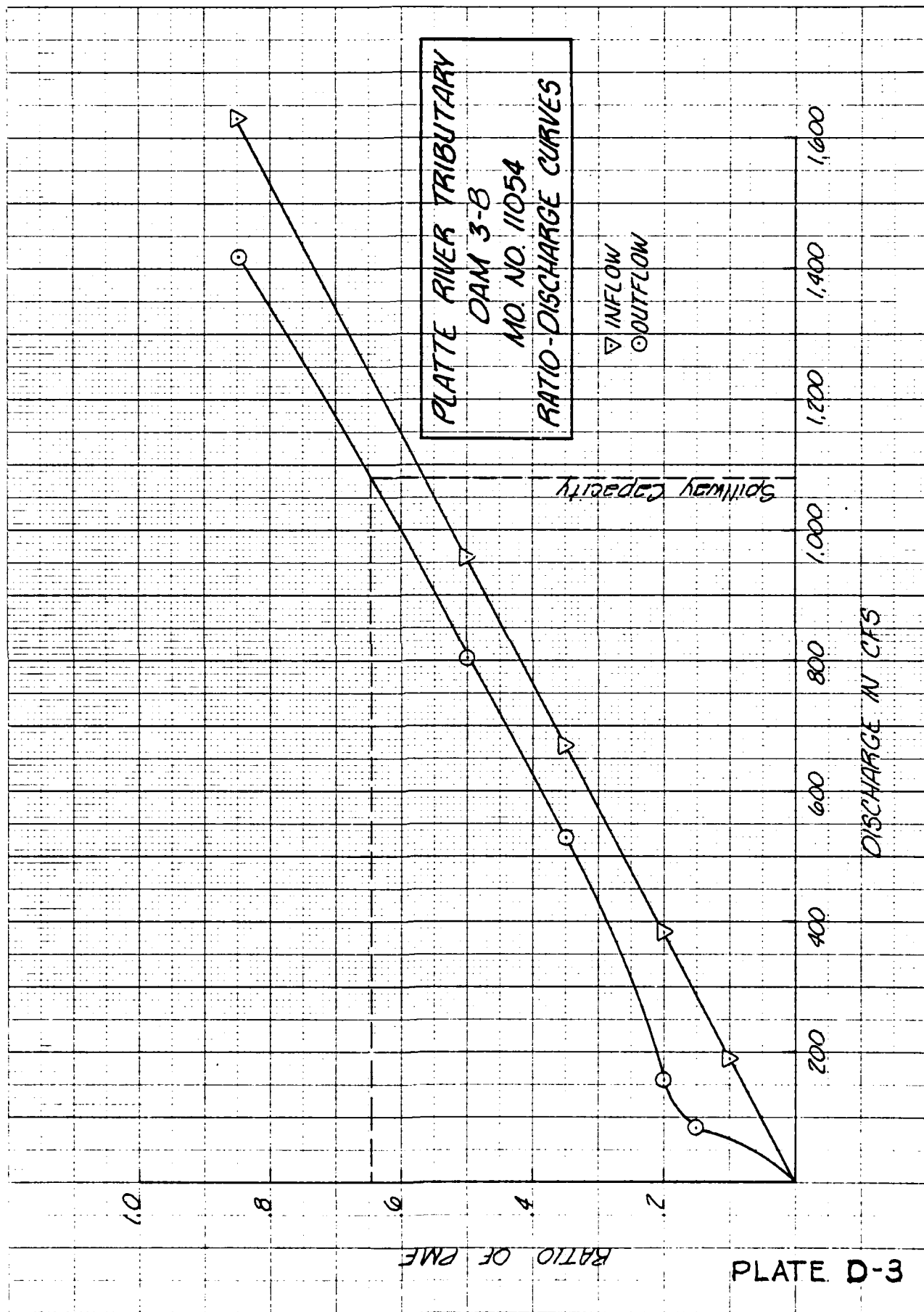
H = total head, ft.

K_r = coefficient for riser = 0.65 (SCS plans)

K_p = coefficient for pipe friction loss = 0.0124
(ES-42, SCS NEH, Section 5)

L = length of pipe, ft. = 130 (SCS plans)

- b. The emergency spillway rating curve was developed by the SCS using ES-124 (see plans)
- c. The flows over the dam were determined by using the dam overtopping analyses (irregular top of dam) within the HEC-1 (Dam Safety Version) program.
3. Floods were routed through the reservoir using the HEC-1 (Dam Safety Version) program to determine the capabilities of the spillway and dam embankment crest. The input, output and plotted hydrographs are attached in this Section.



A1	ANALYSIS OF DAM OVERTOPPING USING RATIOS OF PMF		
A2	H & H ANALYSIS OF SAFETY OF PLATTE RIV TRIB DAM 3-B MD NO 11054		
A3	RATIOS OF PMF ROUTED THRU THE RESERVOIR		
B	000288000000000000000005	000000000000000000000003	
B1000005			
J	000001000000000000000001		
J1000.0500000.1000000.1500000.2000000.3500000.5000000.85000001.0			
K	0000000000000001	000000000000000000000001	
K1	CALCULATION OF INFLOW HYDRO TO RESERVOIR 3-B		
M	000001000000020000.175	0000.175000001.0	0000000001
P	000000000023.7000001020000012100000130		
T		-1.0	-88.0
M2	00000.17		
X	000000	-0.0100000001	
K	00000100000002	000000020000000000000001	
K1	ROUTED FLOWS THRU RESERVOIR 3-B		
Y	0000000100000001		
Y1000001		-120.0	-1
Y40120.0000120.5000121.0000121.5000122.0000123.0000124.0000125.0000126.0000128.0			
Y40130.0			
Y50000000000018000000051000000650000000660000006700000105000000274000000598000001474			
Y5002327			
\$A0000.1000000.5000001.0000001.8000002.7000002.9000003.1000003.4000003.7000004.0			
\$A0004.4000005.3000006.3			
\$E0098.0000108.0000112.0000116.0000120.0000121.0000122.0000123.0000124.0000125.0			
\$E0126.0000128.0000130.0			
\$F0120.0			
\$H0127.1000002.8000001.5000000335			
\$L00000000000048000001280000014500000295000000315000000335			
\$V0127.1000127.4000127.6000127.8000127.9000128.5000129.8			
K	000099		
A			
A			
A			
A			
A			
A			

 FLOOD HYDROGRAPH PACKAGE (HEC-1)
 DAM SAFETY VERSION JULY 1978
 LAST MODIFICATION 26 FEB 79

RUN DATE# 06/06/74.
 TIME# 19.13.40.

ANALYSIS OF DAM OVERTOPPING USING RATIOS OF PMF
 H & H ANALYSIS OF SAFETY OF PLATIE RIV TRIB DAM 3-B MD NO 11054
 RATIOS OF PMF ROUTED THRU THE RESERVOIR

JOB SPECIFICATION									
NO	NHR	NMIN	IDAY	IHR	IMIN	METRC	IFLT	IHRT	NSTAN
288	0	5	0	0	0	0	0	3	0
			LOPER	NWT	LROFT	TRACE			
			5	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED

PLAN= 1 NR110- 8 (RTIO= 1)
 RTIOS= .05 .10 .15 .20 .25 .50 .65 1.00

SUB-AREA RUNOFF COMPUTATION

CALCULATION OF INFLOW HYDRO TO RESERVOIR 3-B

ISTAQ	ICOMP	IECON	ITAPE	JPLI	JPRI	INAME	ISTAGE	IAUTO
000001	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

HYDRO	TIME	TAREA	SNAP	TRSDA	IRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	.18	0.00	.18	1.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	23.70	102.00	121.00	130.00	0.00	0.00	0.00

LOSS DATA

LROFT	STRIR	ULIR	RTIOL	ERAIN	STRIS	RTIOK	STRIL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	-1.00	-88.00	0.00	0.00

CURVE NO = -88.00 WEINESS = -1.00 EFFECT CN = 88.00

UNIT HYDROGRAPH DATA

IC= 0.00 LAG= .17

RECESSION DATA

STRIO= 0.00 GRFSN= -.01 RTIOR= 1.00

UNIT HYDROGRAPH 12 END OF PERIOD ORDINATES, IC= 0.00 HOURS, IAG= .17 VOL= 1.00
 1.1. 367. 378. 237. 119. 64. 34. 18. 9. 5.
 3. 1.

END OF PERIOD FLOW

NO. DA	HR. MIN	PERIOD	RAIN	EXCS	LOSS	COMP U	NO. DA	HR. MIN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.05	1	.01	0.00	.01	0.	1.01	12.05	145	.20	.19	.01	97.
1.01	.10	2	.01	0.00	.01	0.	1.01	12.10	146	.20	.19	.01	146.
1.01	.15	3	.01	0.00	.01	0.	1.01	12.15	147	.20	.19	.01	196.
1.01	.20	4	.01	0.00	.01	0.	1.01	12.20	148	.20	.19	.01	228.
1.01	.25	5	.01	0.00	.01	0.	1.01	12.25	149	.20	.19	.01	245.
1.01	.30	6	.01	0.00	.01	0.	1.01	12.30	150	.20	.19	.01	254.
1.01	.35	7	.01	0.00	.01	0.	1.01	12.35	151	.20	.20	.01	259.
1.01	.40	8	.01	0.00	.01	0.	1.01	12.40	152	.20	.20	.01	261.
1.01	.45	9	.01	0.00	.01	0.	1.01	12.45	153	.20	.20	.01	263.
1.01	.50	10	.01	0.00	.01	0.	1.01	12.50	154	.20	.20	.01	264.
1.01	.55	11	.01	0.00	.01	0.	1.01	12.55	155	.20	.20	.01	265.
1.01	1.00	12	.01	0.00	.01	0.	1.01	13.00	156	.20	.20	.00	265.
1.01	1.05	13	.01	0.00	.01	0.	1.01	13.05	157	.24	.24	.01	271.
1.01	1.10	14	.01	0.00	.01	0.	1.01	13.10	158	.24	.24	.01	285.
1.01	1.15	15	.01	0.00	.01	0.	1.01	13.15	159	.24	.24	.01	301.
1.01	1.20	16	.01	0.00	.01	0.	1.01	13.20	160	.24	.24	.00	310.
1.01	1.25	17	.01	0.00	.01	0.	1.01	13.25	161	.24	.24	.00	315.
1.01	1.30	18	.01	0.00	.01	0.	1.01	13.30	162	.24	.24	.00	318.
1.01	1.35	19	.01	0.00	.01	0.	1.01	13.35	163	.24	.24	.00	320.
1.01	1.40	20	.01	0.00	.01	0.	1.01	13.40	164	.24	.24	.00	321.
1.01	1.45	21	.01	0.00	.01	0.	1.01	13.45	165	.24	.24	.00	321.
1.01	1.50	22	.01	0.00	.01	0.	1.01	13.50	166	.24	.24	.00	322.
1.01	1.55	23	.01	0.00	.01	0.	1.01	13.55	167	.24	.24	.00	322.
1.01	2.00	24	.01	0.00	.01	0.	1.01	14.00	168	.24	.24	.00	322.
1.01	2.05	25	.01	0.00	.01	0.	1.01	14.05	169	.30	.30	.00	330.
1.01	2.10	26	.01	0.00	.01	0.	1.01	14.10	170	.30	.30	.00	352.
1.01	2.15	27	.01	0.00	.01	0.	1.01	14.15	171	.30	.30	.00	375.
1.01	2.20	28	.01	0.00	.01	1.	1.01	14.20	172	.30	.30	.00	389.
1.01	2.25	29	.01	0.00	.01	1.	1.01	14.25	173	.30	.30	.00	396.
1.01	2.30	30	.01	0.00	.01	1.	1.01	14.30	174	.30	.30	.00	400.
1.01	2.35	31	.01	0.00	.01	1.	1.01	14.35	175	.30	.30	.00	403.
1.01	2.40	32	.01	0.00	.01	2.	1.01	14.40	176	.30	.30	.00	404.
1.01	2.45	33	.01	0.00	.01	2.	1.01	14.45	177	.30	.30	.00	405.
1.01	2.50	34	.01	0.00	.01	2.	1.01	14.50	178	.30	.30	.00	405.
1.01	2.55	35	.01	0.00	.01	2.	1.01	14.55	179	.30	.30	.00	405.
1.01	3.00	36	.01	0.00	.01	2.	1.01	15.00	180	.30	.30	.00	406.
1.01	3.05	37	.01	0.00	.01	3.	1.01	15.05	181	.18	.18	.00	392.
1.01	3.10	38	.01	0.00	.01	3.	1.01	15.10	182	.37	.36	.00	371.
1.01	3.15	39	.01	0.00	.01	3.	1.01	15.15	183	.37	.36	.00	393.
1.01	3.20	40	.01	0.00	.01	3.	1.01	15.20	184	.55	.55	.00	457.
1.01	3.25	41	.01	0.00	.01	4.	1.01	15.25	185	.64	.64	.00	564.
1.01	3.30	42	.01	0.00	.01	4.	1.01	15.30	186	1.56	1.55	.01	792.
1.01	3.35	43	.01	0.00	.01	4.	1.01	15.35	187	2.57	2.56	.01	1335.
1.01	3.40	44	.01	0.00	.01	4.	1.01	15.40	188	1.01	1.01	.00	1910.
1.01	3.45	45	.01	0.00	.01	4.	1.01	15.45	189	.64	.64	.00	1916.
1.01	3.50	46	.01	0.00	.01	4.	1.01	15.50	190	.55	.55	.00	1543.
1.01	3.55	47	.01	0.00	.01	5.	1.01	15.55	191	.37	.37	.00	1166.
1.01	4.00	48	.01	0.00	.01	5.	1.01	16.00	192	.37	.37	.00	892.
1.01	4.05	49	.01	0.00	.01	5.	1.01	16.05	193	.28	.28	.00	700.
1.01	4.10	50	.01	0.00	.01	5.	1.01	16.10	194	.28	.28	.00	567.
1.01	4.15	51	.01	0.00	.01	5.	1.01	16.15	195	.28	.28	.00	482.
1.01	4.20	52	.01	0.00	.01	5.	1.01	16.20	196	.28	.28	.00	434.
1.01	4.25	53	.01	0.00	.01	6.	1.01	16.25	197	.28	.28	.00	409.
1.01	4.30	54	.01	0.00	.01	6.	1.01	16.30	198	.28	.28	.00	394.
1.01	4.35	55	.01	0.00	.01	6.	1.01	16.35	199	.28	.28	.00	386.
1.01	4.40	56	.01	0.00	.01	6.	1.01	16.40	200	.28	.28	.00	383.
1.01	4.45	57	.01	0.00	.01	6.	1.01	16.45	201	.28	.28	.00	382.
1.01	4.50	58	.01	0.00	.01	6.	1.01	16.50	202	.28	.28	.00	381.
1.01	4.55	59	.01	0.00	.01	6.	1.01	16.55	203	.28	.28	.00	381.
1.01	5.00	60	.01	.01	.01	7.	1.01	17.00	204	.28	.28	.00	381.

1.01	5.05	61	.01	.01	.01	7.	1.01	17.05	205	.22	.22	.00	374.
1.01	5.10	62	.01	.01	.01	7.	1.01	17.10	206	.22	.22	.00	352.
1.01	5.15	63	.01	.01	.01	7.	1.01	17.15	207	.22	.22	.00	329.
1.01	5.20	64	.01	.01	.01	7.	1.01	17.20	208	.22	.22	.00	315.
1.01	5.25	65	.01	.01	.01	7.	1.01	17.25	209	.22	.22	.00	307.
1.01	5.30	66	.01	.01	.01	7.	1.01	17.30	210	.22	.22	.00	304.
1.01	5.35	67	.01	.01	.01	7.	1.01	17.35	211	.22	.22	.00	302.
1.01	5.40	68	.01	.01	.01	7.	1.01	17.40	212	.22	.22	.00	301.
1.01	5.45	69	.01	.01	.01	8.	1.01	17.45	213	.22	.22	.00	300.
1.01	5.50	70	.01	.01	.01	8.	1.01	17.50	214	.22	.22	.00	300.
1.01	5.55	71	.01	.01	.01	8.	1.01	17.55	215	.22	.22	.00	300.
1.01	6.00	72	.01	.01	.01	8.	1.01	18.00	216	.22	.22	.00	300.
1.01	6.05	73	.06	.03	.03	11.	1.01	18.05	217	.02	.02	.00	275.
1.01	6.10	74	.06	.03	.03	21.	1.01	18.10	218	.02	.02	.00	200.
1.01	6.15	75	.06	.04	.04	32.	1.01	18.15	219	.02	.02	.00	123.
1.01	6.20	76	.06	.04	.04	40.	1.01	18.20	220	.02	.02	.00	75.
1.01	6.25	77	.06	.04	.04	45.	1.01	18.25	221	.02	.02	.00	51.
1.01	6.30	78	.06	.04	.04	49.	1.01	18.30	222	.02	.02	.00	38.
1.01	6.35	79	.06	.04	.04	51.	1.01	18.35	223	.02	.02	.00	31.
1.01	6.40	80	.06	.04	.04	53.	1.01	18.40	224	.02	.02	.00	28.
1.01	6.45	81	.06	.04	.04	55.	1.01	18.45	225	.02	.02	.00	26.
1.01	6.50	82	.06	.04	.04	57.	1.01	18.50	226	.02	.02	.00	25.
1.01	6.55	83	.06	.05	.05	58.	1.01	18.55	227	.02	.02	.00	24.
1.01	7.00	84	.06	.05	.05	60.	1.01	19.00	228	.02	.02	.00	24.
1.01	7.05	85	.06	.05	.05	61.	1.01	19.05	229	.02	.02	.00	24.
1.01	7.10	86	.06	.05	.05	62.	1.01	19.10	230	.02	.02	.00	24.
1.01	7.15	87	.06	.05	.05	63.	1.01	19.15	231	.02	.02	.00	24.
1.01	7.20	88	.06	.05	.05	64.	1.01	19.20	232	.02	.02	.00	24.
1.01	7.25	89	.06	.05	.05	65.	1.01	19.25	233	.02	.02	.00	24.
1.01	7.30	90	.06	.05	.05	66.	1.01	19.30	234	.02	.02	.00	24.
1.01	7.35	91	.06	.05	.05	67.	1.01	19.35	235	.02	.02	.00	24.
1.01	7.40	92	.06	.05	.05	67.	1.01	19.40	236	.02	.02	.00	24.
1.01	7.45	93	.06	.05	.05	68.	1.01	19.45	237	.02	.02	.00	24.
1.01	7.50	94	.06	.05	.05	69.	1.01	19.50	238	.02	.02	.00	24.
1.01	7.55	95	.06	.05	.05	69.	1.01	19.55	239	.02	.02	.00	24.
1.01	8.00	96	.06	.05	.05	70.	1.01	20.00	240	.02	.02	.00	24.
1.01	8.05	97	.06	.05	.05	70.	1.01	20.05	241	.02	.02	.00	24.
1.01	8.10	98	.06	.05	.05	71.	1.01	20.10	242	.02	.02	.00	24.
1.01	8.15	99	.06	.05	.05	71.	1.01	20.15	243	.02	.02	.00	24.
1.01	8.20	100	.06	.05	.05	72.	1.01	20.20	244	.02	.02	.00	24.
1.01	8.25	101	.06	.05	.05	72.	1.01	20.25	245	.02	.02	.00	24.
1.01	8.30	102	.06	.05	.05	73.	1.01	20.30	246	.02	.02	.00	24.
1.01	8.35	103	.06	.05	.05	73.	1.01	20.35	247	.02	.02	.00	24.
1.01	8.40	104	.06	.05	.05	74.	1.01	20.40	248	.02	.02	.00	24.
1.01	8.45	105	.06	.06	.06	74.	1.01	20.45	249	.02	.02	.00	24.
1.01	8.50	106	.06	.06	.06	74.	1.01	20.50	250	.02	.02	.00	24.
1.01	8.55	107	.06	.06	.06	75.	1.01	20.55	251	.02	.02	.00	24.
1.01	9.00	108	.06	.06	.06	75.	1.01	21.00	252	.02	.02	.00	24.
1.01	9.05	109	.06	.06	.06	75.	1.01	21.05	253	.02	.02	.00	24.
1.01	9.10	110	.06	.06	.06	76.	1.01	21.10	254	.02	.02	.00	24.
1.01	9.15	111	.06	.06	.06	76.	1.01	21.15	255	.02	.02	.00	24.
1.01	9.20	112	.06	.06	.06	76.	1.01	21.20	256	.02	.02	.00	24.
1.01	9.25	113	.06	.06	.06	76.	1.01	21.25	257	.02	.02	.00	24.
1.01	9.30	114	.06	.06	.06	77.	1.01	21.30	258	.02	.02	.00	24.
1.01	9.35	115	.06	.06	.06	77.	1.01	21.35	259	.02	.02	.00	24.
1.01	9.40	116	.06	.06	.06	77.	1.01	21.40	260	.02	.02	.00	24.
1.01	9.45	117	.06	.06	.06	77.	1.01	21.45	261	.02	.02	.00	24.
1.01	9.50	118	.06	.06	.06	77.	1.01	21.50	262	.02	.02	.00	24.
1.01	9.55	119	.06	.06	.06	78.	1.01	21.55	263	.02	.02	.00	24.
1.01	10.00	120	.06	.06	.06	78.	1.01	22.00	264	.02	.02	.00	24.
1.01	10.05	121	.06	.06	.06	78.	1.01	22.05	265	.02	.02	.00	24.
1.01	10.10	122	.06	.06	.06	78.	1.01	22.10	266	.02	.02	.00	24.

1.01	10.15	123	.06	.06	.00	73.	1.01	22.15	267	.02	.00	24.
1.01	10.20	124	.06	.06	.00	73.	1.01	22.20	268	.02	.00	24.
1.01	10.25	125	.06	.06	.00	79.	1.01	22.25	269	.02	.00	24.
1.01	10.30	126	.06	.06	.00	79.	1.01	22.30	270	.02	.00	24.
1.01	10.35	127	.06	.06	.00	79.	1.01	22.35	271	.02	.00	24.
1.01	10.40	128	.06	.06	.00	79.	1.01	22.40	272	.02	.00	24.
1.01	10.45	129	.06	.06	.00	79.	1.01	22.45	273	.02	.00	24.
1.01	10.50	130	.06	.06	.00	79.	1.01	22.50	274	.02	.00	24.
1.01	10.55	131	.06	.06	.00	79.	1.01	22.55	275	.02	.00	24.
1.01	11.00	132	.06	.06	.00	80.	1.01	23.00	276	.02	.00	24.
1.01	11.05	133	.06	.06	.00	80.	1.01	23.05	277	.02	.00	24.
1.01	11.10	134	.06	.06	.00	80.	1.01	23.10	278	.02	.00	24.
1.01	11.15	135	.06	.06	.00	80.	1.01	23.15	279	.02	.00	24.
1.01	11.20	136	.06	.06	.00	80.	1.01	23.20	280	.02	.00	24.
1.01	11.25	137	.06	.06	.00	80.	1.01	23.25	281	.02	.00	24.
1.01	11.30	138	.06	.06	.00	80.	1.01	23.30	282	.02	.00	24.
1.01	11.35	139	.06	.06	.00	80.	1.01	23.35	283	.02	.00	24.
1.01	11.40	140	.06	.06	.00	80.	1.01	23.40	284	.02	.00	24.
1.01	11.45	141	.06	.06	.00	80.	1.01	23.45	285	.02	.00	24.
1.01	11.50	142	.06	.06	.00	81.	1.01	23.50	286	.02	.00	24.
1.01	11.55	143	.06	.06	.00	81.	1.01	23.55	287	.02	.00	24.
1.01	12.00	144	.06	.06	.00	81.	1.02	0.00	288	.02	.00	24.
SUM 30.81 29.23 1.58 39538. (783.) (742.) (40.) (1119.59)												

CFS	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
1916.	1916.	446.	137.	137.	137.	39527.
CMS	54.	13.	4.	4.	4.	1119.
INCHES		23.73	29.18	29.18	29.18	29.18
MM		602.67	741.23	741.23	741.23	741.23
AC-FT		221.	272.	272.	272.	272.
THOUS CU M		273.	336.	336.	336.	336.

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 1

CFS	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
96.	96.	22.	7.	7.	7.	1976.
3.	3.	1.	0.	0.	0.	56.
CMS		1.19	1.46	1.46	1.46	1.46
INCHES		30.13	37.06	37.06	37.06	37.06
MM		11.	14.	14.	14.	14.
AC-FT		14.	17.	17.	17.	17.
THOUS CU M						

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 2

CFS	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
192.	192.	45.	14.	14.	14.	3953.
5.	5.	1.	0.	0.	0.	112.
CMS		2.37	2.92	2.92	2.92	2.92
INCHES		60.27	74.12	74.12	74.12	74.12
MM		22.	27.	27.	27.	27.
AC-FT		27.	34.	34.	34.	34.
THOUS CU M						

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 3

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
207.	67.	21.	21.	5929.
CFS	2.	1.	1.	168.
CM	3.56	4.38	4.38	4.38
INCHES	90.40	111.18	111.18	111.18
MM	33.	41.	41.	41.
AC-FT	41.	50.	50.	50.
THOUS CU M				

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 4

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
201.	89.	27.	27.	7905.
11.	3.	1.	1.	224.
CFS	4.75	5.84	5.84	5.84
CM	120.53	148.25	148.25	148.25
INCHES	44.	54.	54.	54.
MM	55.	67.	67.	67.
AC-FT				
THOUS CU M				

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 5

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
670.	156.	48.	48.	13835.
19.	4.	1.	1.	392.
CFS	8.30	10.21	10.21	10.21
CM	210.93	259.43	259.43	259.43
INCHES	77.	95.	95.	95.
MM	96.	118.	118.	118.
AC-FT				
THOUS CU M				

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 6 1/2 PMF

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
958.	223.	69.	69.	19764.
27.	6.	2.	2.	560.
CFS	11.86	14.59	14.59	14.59
CM	301.33	370.62	370.62	370.62
INCHES	111.	136.	136.	136.
MM	137.	168.	168.	168.
AC-FT				
THOUS CU M				

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 7

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
1428.	379.	117.	117.	33598.
46.	11.	3.	3.	951.
CFS	20.17	24.80	24.80	24.80
CM	512.27	630.05	630.05	630.05
INCHES	188.	231.	231.	231.
MM	232.	285.	285.	285.
AC-FT				
THOUS CU M				

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 8 PMF

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
1716.	446.	137.	137.	39527.
CFS				

CMS 54. 13. 4. 4. 1119.
 INCHES 23.73 29.18 29.18
 MM 741.23 741.23 741.23
 AC-FT 272. 272. 272.
 THOUS CU M 336. 336. 336.

HYDROGRAPH ROUTING

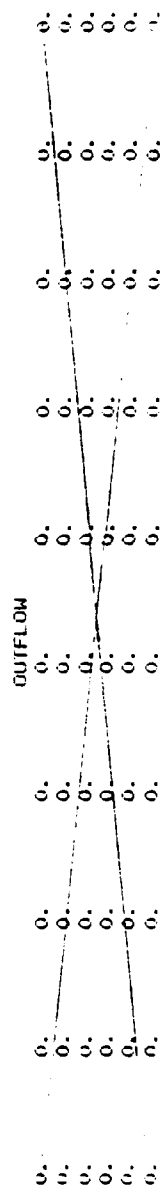
ROUTED FLOWS THRU RESERVOIR 3-B

STAGE	120.00	120.50	121.00	121.50	122.00	123.00	124.00	125.00	126.00	128.00
FLOW	130.00	18.00	51.00	65.00	66.00	67.00	105.00	274.00	598.00	1474.00
SURFACE AREA=	0.	1.	2.	3.	3.	3.	3.	4.	4.	
	4.	5.	6.							
CAPACITY=	0.	3.	6.	11.	20.	23.	26.	29.	33.	37.
	41.	50.	62.							
ELEVATION=	98.	108.	112.	116.	120.	121.	122.	123.	124.	125.
	126.	128.	130.							

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
000002	1	0	0	2	0	1	0	0
ROUTING DATA								
QLOSS	CLOSS	AVG	IRCS	ISAME	IOPT	IPMP	LSTR	
0.0	0.000	0.00	1	1	0	0	0	
NSTPS NSTDL LAG AMSKK X TSK STORA ISPRAT								
1	0	0	0.000	0.000	0.000	0.000	-120.	-1
DAM DATA								
COEL	SPWID	COGH	EXPW	ELEVL	COGL	CAREA	EXPL	
120.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOPEL COGD EXPD DAMWID								
127.1	127.1	145.	295.	315.	335.			

CREST LENGTH 0. 48. 128. 145. 295. 315. 335.
 AT OR BELOW 127.1 127.4 127.6 127.8 127.9 128.5 129.8
 ELEVATION

STATION 000002-PLAN 1-1, RATIO 1-1
 END-OF-PERIOD-HYDROGRAPH-ORDINATES



STATION 000002, PLAN 1, RATIO ϵ $\left| \frac{V}{V_0} \right| P_1 F$

END-OF-PERIOD HYDROGRAPH ORIGINATES

OUTFLOW										STORAGE									
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
34.	35.	36.	37.	38.	39.	40.	41.	42.	43.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
37.	38.	39.	40.	41.	42.	43.	44.	45.	46.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
38.	39.	40.	41.	42.	43.	44.	45.	46.	47.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
39.	40.	41.	42.	43.	44.	45.	46.	47.	48.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
40.	41.	42.	43.	44.	45.	46.	47.	48.	49.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
65.	66.	67.	68.	69.	70.	71.	72.	73.	74.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
71.	72.	73.	74.	75.	76.	77.	78.	79.	80.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
149.	150.	151.	152.	153.	154.	155.	156.	157.	158.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
199.	200.	201.	202.	203.	204.	205.	206.	207.	208.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
740.	741.	742.	743.	744.	745.	746.	747.	748.	749.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
217.	218.	219.	220.	221.	222.	223.	224.	225.	226.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
164.	165.	166.	167.	168.	169.	170.	171.	172.	173.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
100.	101.	102.	103.	104.	105.	106.	107.	108.	109.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
67.	68.	69.	70.	71.	72.	73.	74.	75.	76.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
63.	64.	65.	66.	67.	68.	69.	70.	71.	72.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.

#OVF*

STATION000002

	0.	200.	400.	600.	800.	1000.	0.	0.	0.	0.	0.	0.	0.	0.	0.
.05 11
.10 21
.15 31
.20 41
.25 51
.30 61
.35 71
.40 81
.45 91
.50 101
.55 111
1.00 121
1.05 131
1.10 141
1.15 151
1.20 161
1.25 171
1.30 181
1.35 191
1.40 201
1.45 211
1.50 221
1.55 231
2.00 241
2.05 251
2.10 261
2.15 271
2.20 281
2.25 291
2.30 301
2.35 311
2.40 321
2.45 331
2.50 341
2.55 351
3.00 361
3.05 371
3.10 381
3.15 391
3.20 401
3.25 411
3.30 421
3.35 431
3.40 441
3.45 451
3.50 461
3.55 471
4.00 481
4.05 491
4.10 501
4.15 511
4.20 521
4.25 531
4.30 541
4.35 551
4.40 561

AD-A105 150

HOSKINS-WESTERN-SONDEREGGER INC LINCOLN NE

F/6 13/13

NATIONAL DAM SAFETY PROGRAM. PLATTE RIVER TRIBUTARIES DAM 3-B (--ETC(U)

JUN 80 R S DECKER, G JAMISON, G ULMER

DACW43-80-C-0071

UNCLASSIFIED

NL

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2107 5



END

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END-OF-PERIOD HYDROGRAPH ORDINATES

PLATE D-18

PEAK	OUTFLOW IS	1723. AT TIME	15.83 HOURS
1	1723. AT TIME	15.83 HOURS	

PLATE D-19

UNIT *

STATION 000000

	0.	400.	800.	1200.	1600.	2000.	0.	0.	0.	0.	0.	0.
.05 11												
.10 21												
.15 31												
.20 41												
.25 51												
.30 61												
.35 71												
.40 81												
.45 91												
.50 101												
.55 111												
1.00 121												
1.05 131												
1.10 141												
1.15 151												
1.20 161												
1.25 171												
1.30 181												
1.35 191												
1.40 201												
1.45 211												
1.50 221												
1.55 231												
2.00 241												
2.05 251												
2.10 261												
2.15 271												
2.20 281												
2.25 291												
2.30 301												
2.35 311												
2.40 321												
2.45 331												
2.50 341												
2.55 351												
3.00 361												
3.05 371												
3.10 381												
3.15 391												
3.20 401												
3.25 411												
3.30 421												
3.35 431												
3.40 441												
3.45 451												
3.50 461												
3.55 471												
4.00 481												
4.05 491												
4.10 501												
4.15 511												
4.20 521												
4.25 531												
4.30 541												
4.35 551												
4.40 561												

4.45 571
4.50 581
4.55 591
5.00 601
5.05 611
5.10 621
5.15 631
5.20 641
5.25 651
5.30 661
5.35 671
5.40 681
5.45 691
5.50 701
5.55 711
6.00 721
6.05 731
6.10 7401
6.15 7501
6.20 7601
6.25 7701
6.30 7801
6.35 79.1
6.40 80.1
6.45 81.1
6.50 82.1
6.55 83.1
7.00 84.1
7.05 85.01
7.10 86.01
7.15 87.01
7.20 88.01
7.25 89.01
7.30 90.01
7.35 91.01
7.40 92.01
7.45 93.01
7.50 94.01
7.55 95.01
8.00 96.01
8.05 97.01
8.10 98.01
8.15 99.1
8.20 100.1
8.25 101.1
8.30 102.1
8.35 103.1
8.40 104.1
8.45 105.1
8.50 106.1
8.55 107.1
9.00 108.1
9.05 109.1
9.10 110.1
9.15 111.1
9.20 112.1
9.25 113.1
9.30 114.1
9.35 115.1
9.40 116.1
9.45 117.1
9.50 118.1

PLATE D-22

PLATE D-23

This image shows a full page of graph paper. It features a uniform grid of small dots forming squares across the entire surface. There are no margins, text, or other markings present.

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS							
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8
				.05	.10	.15	.20	.35	.50	.85	1.00
HYDROGRAPH AT	000001	.18 .45)	1 (	96. 2.71)	192. 5.42)	287. 8.14)	383. 10.85)	670. 18.99)	958. 27.12)	1628. 46.11)	1916. 54.24)
	000002	.18 .45)	1 (	52. 1.46)	66. 1.87)	81. 2.29)	159. 4.50)	529. 14.98)	801. 22.69)	1419. 40.18)	1723. 48.80)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1	ELEVATION STORAGE OUTFLOW	INITIAL VALUE 120.00 20. 0.	SPILLWAY CREST 120.00 20. 0.	TOP OF DAM 127.10 46. 1080.	RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
					.05	121.02	0.00	23.	52.	0.00	15.92	0.00
					.10	122.10	0.00	26.	66.	0.00	16.08	0.00
					.15	123.37	0.00	30.	81.	0.00	16.17	0.00
					.20	124.32	0.00	34.	159.	0.00	16.08	0.00
					.35	125.79	0.00	40.	529.	0.00	15.83	0.00
					.50	126.46	0.00	43.	801.	0.00	15.83	0.00
					.85	127.71	.61	49.	1419.	.25	15.83	0.00
					1.00	128.02	.92	51.	1723.	.42	15.83	0.00